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Exploring the Impact of Reality Pedagogy: Understanding its Implementation on Urban Immigrant Students

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Abstract This ethnographic case study follows two urban immigrant students in their yearlong journey in an urban science classroom where the first two pedagogic tools of reality pedagogy (cogenerative dialogue and co-teaching) were implemented. This study examines the role reality pedagogy plays in the science classroom for these two students, while focusing on their social capital and how distributed cognition is used to frame understanding. The three emergent themes that were generated and observed among the two participants indicated that the implementation of the first two tools of reality pedagogy increased the two immigrant students' participation within their science classroom, increased opportunities for voice in the classroom, and increased ability to access the human and physical resources of the classroom for the participants' own benefit. The study revealed that both students' social capital was impacted and the frame of distributed cognition played a role in their science classroom participation. Implications relate to the importance of developing community within science classrooms for immigrant students.

Keywords Immigrant Students, Urban Science Classroom, Reality Pedagogy, Cogenerative Dialogue, Co-teaching

1. Introduction

Research in the field of education of immigrant students indicates that immigrant students "conceptualize [class] participation in ways that differ from the bulk of the literature, and these differences have important ramifications for current teachers and future research" [1]. For immigrant students, as Patchen [1] states, just by participating in the classroom such as answering questions, offering opinions, presenting group work, or asking questions, these common classroom acts have "the potential to expand an awareness to self, increase the capacity for tolerating dissent, and broaden the ability to support others while generating a more practical sense of community and safety." Furthermore, for immigrant students' class participation, "care" [2-4] from peers and teachers helps increase participation. When teachers "communicated more openly, asked students about themselves and their lives, provided comprehensible input, and did not embarrass or ignore them, or allow other students to do so," it fostered a sense of care and resulted in an increase in class participation among immigrant students [1].

Since there can exist a level of social discomfort among immigrant students in a given classroom that can potentially hinder their learning and academic performance, research in this area encourages broader communication among immigrant students with their teachers and peers in order to alleviate this sort of discomfort. As Skuza [5] indicates, "Underlying an immigrant's acculturation is the communication process…. After all, communication is a central and fundamental mode of human learning and expression." This study examines a recently developed perspective called reality pedagogy [6]. With its central goal being to support both teachers and students toward improving the experience of both groups in teaching and learning science in an urban academic environment, reality pedagogy in this study is examined via the lenses of social capital [7] and distributed cognition [8]. These two lenses are used in order to understand what role reality pedagogy, namely cogenerative dialogue and co-teaching, plays in the science classroom experiences of immigrant students.

2. Conceptual Framework/Literature Review

Emdin [9] coined the phrase reality pedagogy as an outgrowth of past research in urban classrooms and focuses primarily on understanding urban students and their culture within a particular social space, such as the science classroom. Parallel in some ways to critical pedagogy, reality pedagogy functions to develop students' consciousness about the sociopolitical factors that impact the teaching and learning process [11]. Toward meeting its goals, reality

pedagogy engages five pedagogic tools, which involve students and their teacher collaborating together to improve the teaching and learning of science. These five pedagogic tools are: cogenerative dialogue (cogens), co-teaching, cosmopolitanism, and—more recently developed—context and content [6]. In this study, we focus on the implementation of the first two pedagogic tools (cogenerative dialogue and co-teaching).

Cogenerative Dialogue: The primary goal of cogenerative dialogues (cogens) is to make collective decisions about the responsibilities, roles, and rules that preside over students' classroom lives [12]. Cogens are discussions with students about what inhibits their engagement in the classroom. Thus, cogenerative dialogues are in essence dialogues that students have with their peers and teacher to co-create a plan of action for their class. The cogens allow teachers to teach in a more culturally relevant manner, as they allow teachers to hear and "take part in conversations that can shift teaching practices in ways that reflect student standpoints and insight into the inner-workings of the classroom" [11]. As the instruction becomes more culturally relevant, it is more effective because it is "based on students' thoughts and ideas instead of teachers' conceptions or assumptions about their students' culture" [11].

The structure of a cogen session that was implemented in this study was to have four to six students and their science teacher (during lunch, before or after school) discusses a science class they all are a part of. The teacher and students engage in a critical deconstruction of what happened in the classroom. Then, as a group, all decide at least one thing that the group can do to improve teaching and learning when they return to the classroom. In these dialogues, a small group of students are given the opportunity to reflect on their classroom learning, and, most importantly, provide their teacher with an insight into what can work well in the classroom from the students' perspective.

Co-teaching: Reality pedagogy defines co-teaching in two scenarios. In the first scenario, the student-teacher is considered as having more knowledge and expertise on how to best deliver the content to reach the rest of the class. Here, the student-teacher (or student-teachers) delivers the content in the way they feel is relevant to their peers in the class. Co-teaching methods in this first scenario call for a role reversal between the teacher and the student. In co-teaching, the teacher is both physically and symbolically positioned to learn from the student-teacher, while the student-teacher is allowed the opportunity to prepare and teach the lesson. Enacting co-teaching in this manner, the teacher "takes notes on the way the student enacts pedagogy, documents the specific examples the student uses, records the way the student interacts with peers, and learns how to teach in ways that reflect the realities of student experiences" [11]. The teacher here in the classroom thus plays the role of a novice learner. In developing the lesson-plan and preparing the content to teach, the teacher also plays a role in helping the student-teacher while providing necessary teaching materials, textbooks, or web resources, like lesson plans and any other instructional or content-related materials.

In the second co-teaching scenario, "The goal is to harness strengths (by allowing students to teach what they know well) and address content deficiencies (by allowing students to teach their peers who need help with content knowledge on specific topics)…. It focuses on youth who feel responsible for each other's learning and the collective success of all students within the classroom" [11]. Here, students co-teach science content to one another on a one-to-one basis during class activities in the science class. Students are matched according to their strengths and weaknesses vis-à-vis specific content.

According to McGee and Keller [13], a good way to introduce youth to future professions is to expose them to those professions, and co-teaching in this manner does just that by providing them firsthand experience in teaching (and the teaching profession) and the content of science (and science-related professions). Further, according to Emdin's [6] research, both of these types of co-teaching play a role not only in empowering urban students toward the subject and content of science (particularly the specific contents the students teach), but also encouraging them to consider teaching and the field of science as career options. Both of these types of co-teaching were engaged in this study.

In co-teaching, the student's role in the classroom is not just the role of a learner but one who is more involved in the classroom instruction by taking ownership and responsibility of teaching to support learning. As teachers in the classroom, students feel more connected to their class and develop a stronger desire to learn within it. Such roles may be alternated among students as desired and include, but are not limited to classroom material manager, who maintains the books and instructional equipment; material and equipment distributor, who distributes handouts and equipment; computer/ technology manager, who looks after the technology (computers, laptops, LCD projector, smart-board) in the classroom; greeter of any visitors (teachers, administrators, and any other guests); discussion leader; and "even comedian, who is a designated person to provide comic relief in a class [11]. Such roles, as Emdin explains, "[allow] students to become invested in the daily operation of the classroom, which, in turn, [allow] the teacher to be more effective in the delivery of the content" [11].

Social Capital: Portes [17] states, "Whereas economic capital is in people's bank accounts, and human capital is inside their heads, social capital inheres in the structure of their relationships." Therefore, since utilization of one's social capital is shown to facilitate an effective learning environment for science, learning science requires productive teacher-student and student-student relationships. Thus, it is of great importance that educators look into the intricacies of the social capital students bring to the science classroom.

According to Coleman [18], the dense networks created by those who have shared social capital result in scenarios where everyone within a particular network is so deeply

connected to everyone else in that network that the network is hard to penetrate by outsiders. He argues that within these types of scenarios, trust is growing, and group needs and concerns as co-defined by participants are being met and fulfilled. Burt [19] defines structural holes as the result of breaches in existent social networks that allow for the development of more complex forms of social capital through the diffusion of information. Such classroom dynamics as dense social networks and structural holes are explored in this study to further enlighten the experience of immigrant urban science students.

Figure 1 shows a representation of social capital as it is used in this study. For example, within the classroom structure, the *social capital* is formulated via social interactions that occur in the classroom. These social interactions foster *dense networks*, which may lead to *negative social capital* where outsiders of the dense networks are completely excluded and are unable to gain from the capital. In creating *structural holes* within these dense networks, negative social capital is alleviated, and where weak ties are allowed to be formed between new acquaintances, a new source of knowledge is found. Portes [17] further states that "to possess social capital, a person must be related to others, and it is those others, not himself, who are the actual sources of his or her advantage." In the present study, we use the social capital framework to conceptualize how the two immigrant youths obtain social capital while attempting to relate to their non-immigrant urban classmates to make the classroom environment functional for themselves.

Distributed Cognition: The human mind does not evolve in isolation from the social and material world. Several researchers propose that our brain is designed to take advantage of the minute-to-minute details of our bodies and the interaction of our bodies with the physical environment [20-21]. The activities in the human mind are interlaced, even inextricably, with the material and social world [22]. Most simply put, an example of a system of distributed cognition is a group of people working together. "In such a case, cognition is distributed across brains, bodies, and a culturally constituted world" [8]. A person working alone with, and even without, materials or tools is also considered an example of distributed cognition. "The point is that distributed cognition is not a kind of cognition at all, it is a perspective on cognition. Its chief value is that it poses questions in new ways and leads to new insights…. Distributed cognition sees real-world cognition as a process that involves the interaction of the consequences of past experience (for individual, group, and material world) with the affordances of the present. In this sense, culture is built into the distributed cognition perspective as at least a context for cognition" [8].

The ways in which cognition is distributed from a cultural point of view are: (a) between a culturally constructed environment and a person, (b) through time, and (c) in socially organized settings, among the people in that setting. In real-world interaction and activities of a science classroom, all of these sorts of distribution and interaction take place simultaneously. The distributed cognition perspective thus suggests that, along with the individuals in a given environment, the environment itself and the materials/tools in that environment are a source of support and knowledge. Thus, to form a system of distributed cognition, all parts of the culture of the learning environment come together. In this specific case study, toward setting up a system of distributed cognition, the culture and the pedagogic tools of reality pedagogy themselves played a role.

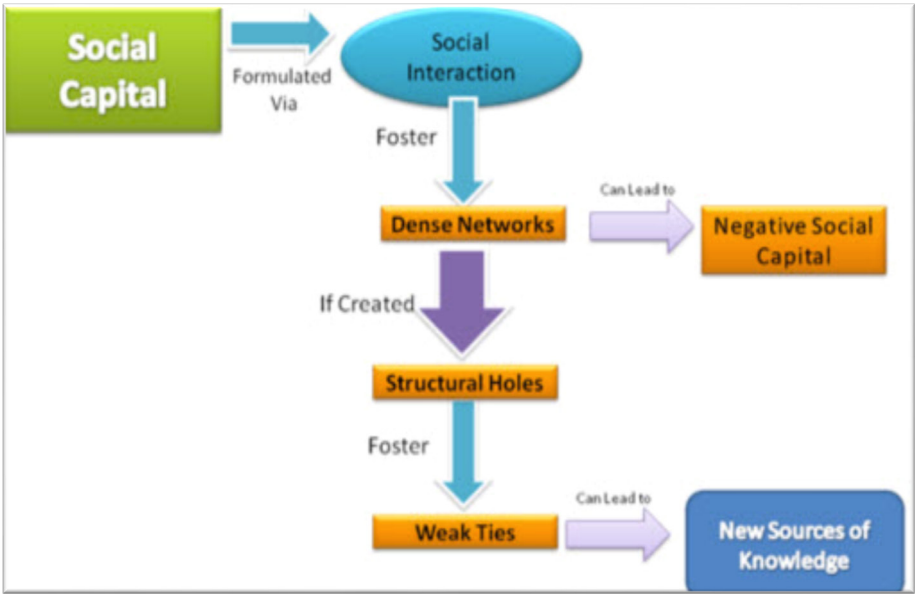

Figure 1. Social Capital as a Theoretical Frame

Alac and Hutchins [23] propose that human interaction is a complex dynamic system and that "typical human-human interactions are composed of many elements, the meanings of which emerge from the network of relations among the elements" [8]. Vygotsky [24] suggests in his theory of the social origins of mind that we need to know more about the distributed ways of thinking within our mental activities and our thoughts that are woven inextricably in the actions of the material and social world. Toward this end, Hutchins [8] notes that with regard to human-human interaction, "much more work needs to be done to document the distribution of cognitive strategies across space, culture, and context."

Researchers of distributed cognition believe that "the attention to microstructure of interaction from the distributed cognition perspective leads to a reconceptualization of the individual-environment relationship and suggests that this newly conceived relation has important implications for the way we confront many sorts of cognitive and anthropological problems. In particular, it provides a new place to look for mechanisms that shape both the ontogenetic and the phylogenetic development of sociality" [8].

3. Methodology

3.1. Setting and Participants

Utilizing ethnographic qualitative research methods in this study, the first author visited the science classroom of the participants once a week. This was done not only to gain knowledge of the classroom environment but also to build a rapport with the students. This specific way of designing the study allowed for enhancement of a number of features of trustworthiness of the study, such as triangulation of multiple data sources to substantiate claims, "prolonged engagement" [25] in the research setting, and acquiring information to provide "rich, thick description" [26-27]. The school is a New York City public school (NYC Medical High, a pseudonym) that includes grades 7 through 12, with approximately 90 students in each grade. NYC Medical High was in its 7th year at the time of the study. This study took place in the Fall 2010 and Spring 2011 academic year in the context of a 10th grade Living Environment science class in NYC Medical High. The school defined immigrant students as any student residing in the United States for five years or less. The Living Environment class included only two such students. With their consent, the study focused on them.

For each visit, the first author conducted cogenerative dialogue sessions with the two students and their teacher during the school's lunch period (all students in this class shared the same lunch schedule). As the year progressed, co-teaching in this classroom was done. This study focuses on two immigrant students, Rabina and Ilia (pseudonyms).

Rabina, age 14, was born in Lagos, Nigeria, and moved to New York at the age of 11 (three years prior to time of this study). She had resided with her mother in Nigeria and moved to New York with her older sister and now lives here with her father, step-mother, and two younger step-siblings. Rabina indicated that, while in Nigeria, she was very involved in her church and used to sing in her church's choir, which she dearly misses. She mentioned that her involvement at her church in Nigeria allowed her to make good friends, as her church choir group included students from her school, and she was able to get to know and spend time with them more intimately and frequently during weekly choir practices. Though Rabina and her family attended a church in New York, she was not involved in the church's choir. The church her family visited was quite far from her residence, which limited her visits and participation in church activities, except during holidays.

In class, Rabina appeared to be a quiet and shy student, and according to her science teacher, Mr. F, she was mindful of her academic performance. Rabina explained that after moving to NYC, she struggled with her Nigerian accent, particularly in school. She generally participated in her classes in Nigeria and recalled that when she volunteered to participate in her 8th grade class at NYC Medical High, the students ostracized her not only because of her accent, but also because she volunteered to participate. Rabina further indicated that she learned a lot about the American culture, such as how to speak with an American accent and using American expressions and colloquialisms while interacting with her younger step-siblings and watching television.

Ilia, age 15, is a Hispanic student from Puerto Rico. She was born in Puerto Rico and moved to New York with her family at the age of 10. Ilia indicated that it was due to her father's change of post in his job that she and her family decided to move to New York. Ilia indicated that her life here was not very different from the life she had in Puerto Rico, as the school system and environment in Puerto Rico were very similar to what she encountered here. The biggest difference in her life after moving here, she pointed out, was that her extended family did not live nearby. Her extended family (grandmother and aunts, particularly) helped raise her. She indicated that she used to visit her extended family every summer after moving to New York until last summer, when she joined a dance congress in New York. Dancing, Ilia indicated, was a big part of her life that she greatly enjoyed and considered as an outlet. She was involved in a dance group from a very young age in Puerto Rico and was very happy that her mother was able to find a similar studio last year in New York that she joined.

Ilia was one of the more talkative students in the class and appeared to communicate with only a certain number of students that she sat in close proximity to in the science class. Though the school system and environment in New York were similar to that of Puerto Rico, the cultural dynamics of the student population, Ilia indicated, were a noticeable difference she experienced when she first came here. Ilia expressed that she often felt excluded by other Hispanic students, particularly by students from the Dominican Republic. For example, in her 7th grade class (when she first

moved to New York), the majority of the student population was from the Dominican Republic. Though this was the case, Ilia specified that over the year this difference in cultural background did not remain as pronounced as it first was as she became more familiar and accustomed to the culture in New York. Ilia pointed out that her "salsa dance" group now in Brooklyn, NY has individuals from various Hispanic/Latino ethnicities (Mexican, Dominican, Puerto Rican), coming from all around New York. Among them, they share common interests, such as salsa dancing, and Ilia enjoys their friendship.

3.2. Design/Procedure

This study addresses two research questions: Which facets of the experience of participating in reality pedagogy are most valuable to the immigrant science students? And, how does reality pedagogy contribute to the social capital of immigrant students? We chose to conduct an ethnographic case study within the methods of qualitative research, as this approach offers not only a "complex, detailed understanding" through the ethnographic research approach [26], but it also offers a deep descriptive level of understanding that provides an "experiential perspective ... that emerges from the context itself" [28]. A case study design was used to gain an "in-depth understanding of the situation [reality pedagogy] and meaning for those involved. The interest was in "the process rather than outcomes, in context rather than a specific variable, in discovery rather than confirmation" [25]. Therefore, this ethnographic case study examined the implementation of the first two C's of reality pedagogy—cogenerative dialogue and co-teaching— and how they impacted two immigrant students' social capital, and how distributed cognition played a role in this process.

3.3. Data Collection

Three data sources were used to inform the research questions. Specifically, the semi-structured interviews with two immigrant students (one from Puerto Rico, the other from Nigeria) and their science (Biology) teacher, weekly classroom observations, and weekly cogenerative dialogues sessions were conducted over one academic year (September 2010-June 2011). All interviews, observations, and dialogues were video-recorded.

3.3.1. Interviews

The two immigrant students were interviewed in order to gain the perspective of the immigrant population of the class regarding the impact of reality pedagogy. The individual interviews of the two immigrant students took place three times in the fall semester and three times in the spring semester. All interviews were conducted using the interview questions on Appendix A. Each student and the teacher were interviewed at distinct times of the academic year. In total, Rabina and Ilia were interviewed six times each in the course of the year, three interviews being in the Fall semester (October/November) and three in the Spring semester (March/April), and the final interview (June). The teacher was also interviewed in order to gather his perspective on the impact of reality pedagogy. He was interviewed four times in the course of the year, two times in the Fall semester (November/December) and two times in the Spring semester (March/May). All interviews were 15-30 minutes in length and were semi-structured in nature. That is, though all questions noted in Appendix A were asked and answered, additional clarification and at times conversational questions were part of the interviews. These additional questions and conversations made the interviewee feel more comfortable, and at times clarification of what was said was gained [28]. Student interviews provided insight into the individual students' experiences, and finally the teacher's interviews allow for an addition perspective on the implementation of this set of pedagogic tools toward a more deep and rich understanding of the phenomenon.

3.3.2. Classroom Observations

Classroom observation began in September and lasted until the first week of June. In total, 34 class sessions were observed and video-recorded. The video camera was stationed at the back of the class, making sure to capture the view of the whole class. Four small audio-recorders were also strategically placed around the four corners of the classroom.

Additional field notes and memos were collected during transcribing the video data. Data were also collected via informal conversations with the students intermittently during weekly visits. Field notes of these informal conversations were also noted at the end of a visiting day if such a conversation took place on a given visiting day. These informal conversations were not video- or audio-recorded, as they took place sporadically.

3.3.3. Cogenerative Dialogues

Cogenerative dialogue sessions began in October and lasted until late December in the Fall 2010 semester. Nine cogenerative dialogue sessions took place and were video-recorded in the fall semester. In the Spring 2011 semester, 14 cogenerative dialogue sessions took place. The study thus includes 23 video-recorded cogenerative dialogue sessions. The cogenerative dialogue sessions were guided using the questions in Appendix B; however, additional questions and topics were discussed as brought up by the teacher and the students themselves. Though the cogenerative dialogue sessions are one of the two C's being implemented in this study, these sessions were also key in understanding the participants' development (via their interactions with other participants in the sessions) throughout the progression of the year.

3.4. Data Analysis

For data analysis, constructivist grounded theory

maintains that "both data and analyses are social constructions that reflect what their production entailed" and "any analysis is contextually situated in time, place, culture, and situation" [29]. Parallel to this notion, we approached the study via "interpretive inquiry," in which "researchers make an interpretation of what they see, hear, and understand" [26]. All data collected for this study were analyzed using the qualitative data analysis software known as Atlas.ti [30]. All video- and audio-recorded data were transcribed and coded for the social capital frame, whereas further "focused coding" allowed the first author to "synthesize and explain larger segments of data" [29] or analytic categories, leading to the emergence of the "distributed cognition" frame. Further, the codes and data were closely studied again to confirm the aspects of the data that identified with the "social capital" and "distributed cognition" frame. The theoretical frame of social capital was discerned when the pilot version of this study was conducted two years prior to this study, and it was with this lens that this study was conducted. The "distributed cognition" frame was emergent from the findings of the study.

In the analysis of the data collected for the study, authors were in essence interested in and looking for an overall progression over time of the implementation of the two Cs. In observing the two immigrant students, for example, if, over time, one of the two students appeared to be more engaged in class, it allowed for a point of interest to investigate. So, during the classroom observations over time, if, for instance, one of the students was talking in regard to the science content being taught in class more and more as the semester progressed, it provided a point of interest to be investigated. In this case, in a consecutive interview, the first author questioned the student about this behavior and looked in her response for an affirmation or negation of whether she felt this increase in engagement in the science class was a reflection of the implementation of the cogenerative dialogue and co-teaching. Also, in this specific student's cogenerative dialogue sessions, the first author looked to see whether she was either more or less engaged in the dialogues as the year progressed and later asked the students in their individual interviews whether they felt this increase in engagement in the science class and the dialogue sessions was a reflection of the implementation of the cogenerative dialogue itself and co-teaching. This either confirmed that implementation of the cogenerative dialogues and co-teaching had an impact in the student becoming more engaged in the class or confirmed that the set of pedagogic tools did not have an overall impact on this specific student. This is also the method via which each of the three sources of data was triangulated. In the findings below, we present the themes generated from analysis and corroborated through peer debriefing and member checking [31].

4. Findings

From the data analysis, three emergent themes were observed and were generated among the two participants of the study, Ilia and Rabina, and the science teacher, Mr. F. Below briefly we discuss these three themes.

4.1. Theme 1: Cogens Increase Participation in the Science Classroom

Toward the beginning of the semester, we noticed that the biology class was quite noisy and the teacher had a difficult time getting students' attention. Students who sat closest to each other talked together, mostly about topics unrelated to the science lesson. Not much communication took place between students who sat further way. Both the teacher and students in the initial cogenerative dialogues and interviews indicated that there were "cliques" in the classroom. Students from two separate 9th grade cohorts were mixed to form this 10th grade cohort. Students indicated in the initial cogenerative dialogue sessions that some students in these two separate cohorts did not get along very well, resulting in confrontations and arguments during class. Cliques formed within the initial 9th grade cohorts, which further caused individual students in the class to stay within their own circle of classroom friends.

The cogen sessions included a mix of students from the whole class, who either volunteered to participate or randomly invited to participate in the cogen sessions. The cogen sessions included students from the different cliques or social groups of the classroom. The cogens created a space and allowed opportunities for Ilia not only to voice her concerns about the classroom environment but also to communicate with students outside her social group. The cogens were held once a week during students' lunch period in the same science classroom.

At a cogen session (and also in an informal conversation), Rabina and Ilia both voiced that the school took nearly a month to establish class schedules. This left many students frustrated, as they were not able to follow a given class from the beginning of the semester. Rabina indicated in one cogen session it took "so long" for the school to establish students' schedules that she became frustrated. In support, Ilia stated, "it took them like three weeks in September and they still don't get it right!" Here, both Rabina and Ilia were given a space to express their thoughts and frustrations about their similar or shared circumstance regarding schedules and classes. Though both students were from separate cliques or social groups in the classroom, they found support and comfort in the cogens, which led to more ease when it came to engaging with one another in future cogens and in classrooms activities during biology class. For instance, Rabina from participating in cogens communicated with students from other social groups in the science classroom. She stated: "I never talked to Monica until at the cogen that day. I helped her when we did the co-teaching on parts of the cell. It was me, Monica, Brian, and Maria in the group, and we presented." Overall, the cogens increased participation of students in the science classroom as students had a space to

communicate with each other while they discovered commonalities among themselves.

4.2. Theme 2: Increased Opportunities to Voice Concerns about the Science Classroom

Ilia also had the opportunity to communicate with students she normally did not communicate with. However, Ilia was one of the students who was involved in a clique in the biology class. Not afraid to vocalize herself, Ilia often called out in class and engaged in conversations with surrounding peers in her clique when Mr. F was teaching. In a cogen, Ilia admitted to calling out: "I know I call out…. I can't help it …" (smiles). Ilia joined the cogenerative dialogue sessions in the second session. She seemed comfortable to talk with peers and Mr. F in the cogen sessions. At times she was even playful with Mr. F, who encouraged a relaxed and friendly environment so that the more reserved students, like Rabina, would feel at ease to participate.

Cogens also allowed Ilia to voice her opinions about specific academic concerns, such as learning biology content or scientific terminology. Particularly, Ilia brought up the difficulty she had with understanding scientific terms, stating in cogens: "It's difficult to understand those big science words. You [Mr. F] have a big vocabulary for the test. But Mr. F your wording!" In the cogens, both Ilia and Rabina, along with other students, discussed and worked with Mr. F so that he could better explain the scientific terms in his lessons. One solution Ilia, Rabina, and others students established was to co-plan with Mr. F. They suggested a glossary in the back of their notebooks, which they decided to add daily when learning new scientific words. This glossary was individual to each student and included scientific words particular students had difficulty with. The glossary also contained English words that immigrant students newly learned that day.

Next to voicing opinions about specific academic concerns, Ilia along with a number of her classmates suggested re-arranging the classroom seating towards alleviating some of the tension students were experiencing due to the existing cliques in the classroom. Mr. F honored this suggestion, which in turn empowered the students, giving them a sense of ownership and place in the classroom.

Cogens not only allowed Ilia to voice her concerns about understanding scientific terminology, but also opened the table to other academic concerns that immigrant students like Rabina had. For example, Rabina shared that she had difficulty with graphs in a recent biology exam in the class. Upon voicing that "the graph was hard," Rabina received immediate support from Ilia, who stated, "I just didn't know what to put! Oh my god! I just put anything [for the graph]," and other students also concurred. Raising her concern about graphing, Rabina gained peer support, and her comment also resulted in a more vigorous review of graphs before the next science exam. Thus, the cogen sessions for Ilia and Rabina expanded their social network and allowed them to receive better instruction in the science classroom.

4.3. Theme 3: Increased Access the Human and Physical Resources from Cogens and Co-teaching

For Ilia and Rabina, their social networks or the number of students they regularly communicated with in their science class was broader due to their participation in cogens and co-teaching. As noted above in the quote from Rabina, she communicated and worked together with Monica, Brian, and Maria (three students with whom she generally did not even talk with in class) when co-teaching the topic on the parts of the cell together with them. While attaining a broader source of new knowledge, Ilia maintained communication with her co-teaching group and other co-teaching groups, as she indicated in an interview: "Me and my group got the chart idea from Maria's group … it helped out when we presented … we gave them our construction paper … that helped them out." This sort of sharing of ideas and human capital (co-teaching presentation methods in this case) and physical resource (construction paper in this case) progressively became part of the students' practice. Rabina mostly engaged in and accessed the human and physical resources of her co-teaching group, whereas Ilia accessed human and physical resources of both her own group and other co-teaching groups. The co-teaching groups were formed based on the topics students were interested in. Thus, if a number of students (no more than 4 to 5) were interested on a given topic, they together co-taught that topic. The structure of co-teaching and the cogens provided access to attain human and physical resources, which in turn benefited both Ilia and Rabina in their co-teaching activities. Interview quotes from Rabina and Ilia indicated this point: Rabina stated, "I got the DNA and protein thing better after we talked it out in my group before co-teaching it." And, Ilia stated, "I like how we charted out the plant cell versus the animal cell in my group…. I got the chart idea from Maria's group … it's more clear to me in the chart."

5. Discussion and Implications

The findings of this study present that the implementation of the 2 C's of reality pedagogy, cogenerative dialogue and co-teaching, generate three major themes among the two participating immigrant students, Rabina and Ilia. These themes explain that while participating in cogens and co-teaching activities, Rabina and Ilia are able to increase participation with their class's social networks and increase opportunities for their voices to be heard in the classroom, and finally, participating in the 2 C's increases their ability to access the human and physical resources of classroom for their own benefit. The communication in both the cogens and co-teaching allows thoughts of one person or even groups to be distributed or shared. In Rabina's case, she mostly practices distributed cognition when working with her

co-teaching group, whereas Ilia practices distributed cognition more broadly to include her group and other co-teaching groups in the class.

The findings show that participation in the 2C's allows Rabina and Ilia to increase their social capital. Within the frame of distributed cognition, their increase in social capital caters to their development as science students and members of the science as they progress through the year. As Rabina and Ilia participate in cogens, they form *weak ties* with one another and other participating students, and when they return to the classroom after participating in cogens, these weak ties innately result in the creation of *structural holes*.

More specifically, viewing cogens and co-teaching via the social capital lens, the cliques or *dense networks* of the initial social groups in the classroom appear to exclude Rabina and students like her from participating in the social networks of her classroom. The cogens themselves and the communication Rabina has with her peers in cogen sessions allows for *structural holes* to be created with these dense networks. Structural holes are also physically created when the classroom seating is re-arranged (per students' suggestion), which together with cogens allow Rabina to create *weak ties* with the students she interacts with. This sort of interaction creates a new source of knowledge (social and academic) for her, which further encourages her to take part in co-teaching activities, even further fostering her social and academic knowledge and social capital overall.

In Ilia's case, participating in cogens creates *structural holes* in her own classroom cliques or *dense networks*, where in the cogen sessions, she begins to communicate with students like Rabina, who are outside Ilia's social group and with whom she never communicated until the cogen sessions. The classroom seating re-arrangement also creates physical structural holes. For Ilia the cogen sessions allow her to interact in other social groups where she is able to recognize that students outside her own social groups share similar concerns noted previously. These sorts of interactions initiate *weak ties* with the students she interacts with in the cogens and carries over to the classroom. She appears to utilize these *new sources of knowledge* with most of this during co-teaching activities and further fosters her social capital.

Due to progressive implementation of cogens and also to the classroom seating re-arrangement (co-planned and decided in cogen sessions) and the implementation of co-teaching, most dense networks are either no longer present or no longer as strong as at the beginning of the school year. Moreover, in both of Rabina and Ilia's cases, the implementation of the 2 C's of reality pedagogy fosters social interaction, thus allowing these immigrant students to gain and share social capital with their peers. Via the co-teaching activities, these dense networks are further broken down, allowing students like Rabina—who has previously experienced negative social capital from her peers (i.e., being excluded from dense networks, unable to gain any capital as an outsider)—to create weak ties with her peers. She gains new knowledge and from new relationships from the cogens and co-teaching.

Both cogens and co-teaching also foster the distributed cognition frame. The frame of distributed cognition is deeply embedded in the structural design and principal concept of cogenerative dialogue sessions and co-teaching, as by design both foster the sharing of ideas and collaboration "across brains" [8]. Though there are others who may debate that distributed cognition is more than collaboration, we argue here that cogens and co-teaching are ingrained at the core of the basic concept of distributed cognition. Hutchins [8] explains that distributed cognition is a perspective of cognition. A simple example could be a group of people working together. Here, "cognition is distributed across brains, bodies, and a culturally constituted world" [8].

Given this is our point of interest, the first two tools of reality pedagogy—cogenerative dialogue and co-teaching—is comparable to the distributed cognitive perspective. Both of these pedagogical tools allow for collaboration among a group of students and their teacher. In cogenerative dialogue group sessions in this study, distributed cognition is practiced while students co-plan a course of action for their science class along with their teacher. All share ideas and eventually execute the co-planned ideas, as demonstrated in their collaboration in rearranging the class seating and establishing a system of having individual glossaries. In addition, in the implementation of co-teaching, students work with their peers in groups and with their teacher while discussing science content in order to gain clarification for themselves and to teach each other the necessary science content. This transfer and distribution of thoughts and explanations are exemplary of distributed cognition. Hutchins [8] further contributes that "a system of multiple interacting subsystems can provide a solution more easily than trying to get all of the constraints out of a single subsystem" (p. 394). In the implementation of both cogenerative dialogues and co-teaching in this study, distributed cognition is practiced, while these two students co-plan and collaboratively work with their peers.

6. Conclusions

This study sheds light on the experiences of two urban immigrant students in their journey in an urban science classroom. The first two pedagogic tools of reality pedagogy, cogenerative dialogue and co-teaching, are implemented in their science class. As the findings indicate, the two immigrant students become more involved in their science class. The use of cogenerative dialogue and co-teaching foster their social capital and assist in building their knowledge via the distributed cognition frame. This study highlights that reality pedagogy raises students' social capital and the perspectives of distributed cognition. In this way, reality pedagogy creates a socially supportive space for immigrant students and promotes overall growth of students

in urban classrooms. Moreover, for both these immigrant students, the implementation of reality pedagogy allows them to gradually become full participants in their science classroom while creating a structure and space conducive to their learning and class participation.

Appendices

Appendix A. Interview Questions

	Questions for Students	Questions for Teacher
Autumn 2010	1. How are the cogenerative dialogues you have with your peers and teachers of your science class helpful or not helpful overall when you come back to your science class? *2. How is co-teaching in your science class helpful or not helpful overall in your science class? 3. Would you say that compared to your other classes, in science class you are or feel different due to cogenerative dialogues and/or co-teaching? If so, how?	1. How are the cogenerative dialogues you have with your students helpful or not helpful overall when you come back to your science class? *2. How is co-teaching in your science class helpful or not helpful overall in your science class? 3. Would you say that compared to your other science classes you are currently teaching, (where cogens and co-teaching is not implemented) the implementation of cogenerative dialogue and/or co-teaching in this class had an impact on this class over all so far? If so, how?
Spring 2011	1. How are the cogenerative dialogues you have with your peers and teachers of your science class helpful or not helpful overall when you come back to your science class? 2. How is co-teaching in your science class helpful or not helpful overall in your science class? 3. Would you say that compared to your other classes, in science class you are or feel different due to cogenerative dialogues and/or co-teaching? If so, how?	1. How are the cogenerative dialogues you have with your students helpful or not helpful overall when you come back to your science class? 2. How is co-teaching in your science class helpful or not helpful overall in your science class? 3. Would you say that compared to your other science classes you are currently teaching, (where cogens and/or co-teaching is not implemented) the implementation of cogenerative dialogue and/or co-teaching in this class had an impact on this class over all so far? If so, how?

Note. *= If co-teaching has not been implemented before the time of the interview, this question will not be asked to the students and the teacher.

Appendix B. Guiding Questions for Cogenerative Dialogues

A. All dialogue session will be video recorded.
B. After a brief introduction of any new participants of the session, each cogenerative dialogue session will begin with listing the rules of the dialogue sessions. In the initial 3 or 4 dialogue sessions the researcher will utter the rules of the session and in the rest of the sessions the students and/or the teacher will be expected to declare the rules before beginning the sessions.
C. The following questions will be asked by the researcher to the group inclusive of the 4-5 students and teacher. These questions will guide the discussion between the teacher and his students. The sessions will be designed such all participants of the session are able to share their response.
D. The discussion of the questions will take two or more cogenerative dialogue sessions.
Guiding questions for teacher-student discussion: 1. What is currently your favorite class in school and why? 2. What is your favorite academic subject and why? 3.* What about the science class you like and don't like? Elaborate. 4.* What in your opinion and experience are the strengths and weaknesses of your science class? 5.* How do you suggest you specifically can contribute to improve the issues you indicate? 6.* What are some ways the class as a whole and your teacher can help improve the student experience in the class? 7. What about your science teacher's way of teaching you like or don't like? Elaborate. 8. How do you suggest he can improve his/ her ways of teaching to help you learn science better?

Note. *=the teacher will be asked to respond to these questions as well.

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The Influence of Teacher Training for the Attention of Students with Intellectual Disabilities in the Transitional Period to Adulthood

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Abstract Nowadays, inclusive schools should be characterized by a high level of commitment in teacher training. To achieve this goal, teachers should be trained in teaching competences in contexts of a great diversity. Their task will be to teach intellectually disabled students by adapting the educational contents through the use of educational resources. In this context, an interdisciplinary training based on integrating social and cultural values is to develop capacities and skills which are related to comprehensive attitudes towards students; attitudes to promote dialogue, as well as a reflection on teacher training combined with an interdisciplinary collaboration. By this way, teachers will assume an educational role based on promoting a more effective teaching process. In the following paper, different renewing methodological proposals are exposed in order to promote the habit to research among teachers. Thus, a more functional learning process in students with intellectual disability will be facilitated according to the features of their educational stage of "Transitional period to adulthood". The goal of this proposal is to carry out the teacher training in educational strategies by adapting didactic resources to the particular student's environment with especial educational needs. Consequently, the appropriate assistance of diversity in classrooms will be finally suited.

Keywords Training, Disability, Inclusive Education, Renewing Methodologies

1. Introduction

The transitional period to adulthood has been an important object of study for the last decades, focused to suit some objectives related to inclusion; these objectives provide continuity to Secondary Education while facilitating the participation of students at schools. Teachers must be properly trained in order to achieve mastery over the necessary competences faced to integrate intellectually disabled students within schools (Marbán, Montserrat and Morán, 2012) [5]. To make this integration a reality, teachers will adapt some educational tools.

The transitional period to adulthood is one of the most complex challenges for students with intellectual disability in Spain, according to Rosselló and Verger (2008) [9] and Vilá, Pallisera and Fullana (2012) [8] [11] reports. These analyses reveal the importance of inclusion in working life contexts and of some tools to use with intellectually disabled people properly supported. Other jobs are focused to Secondary Education highlighting strategies to suit inclusion of intellectually disabled students within occupational contexts both from educational and psycho- pedagogical point of view.

From scholar education, some technical modifications have to be carried out in order to provide planning for the diversity of students in situations of greater vulnerability by integrating them at schools, according to Jordán, Verdugo and Vicent (2005) [3] report.

In this context, special education schools have a more global perspective: these schools have a longer last in time for the subject of transitional period to adulthood than any other school (4years). This long-term period suits the training in different subjects, human relationships, social skills, personal autonomy, as well as the personal ability of the student through occupational working. In both educational contexts, a specific planning faced to this kind of students has to be established according to the respective education regulations.

1.1. The Teacher Facing Conceptual Changes about Intellectual Disabilities

Nowadays, different models related to terminology which

is cutting on the edge according to the original country where it is being used. Let us briefly review these models: the rehabilitating model actions assume that intellectual disability is scientific, so it has to be treated with specific cares focused to the attention and cares that a disabled person requires; the social model is focused on the fact that the environment has to adapt to the needs of the disabled person by supporting him according to some social rules; the diverse functionality model considers communication as an essential process, so the use of an adapted kind of language with disabled people is at present and in coming situations extremely important. The international classification of Working, Disability and Health (in Spanish, CIF) provides a wider and more positive view of everybody's health status, taking into consideration the fact that it involves more than the consequences of illnesses regarding social and cultural context. It's taken as a useful tool for the statistical analysis applicable to the different situations (Verdugo 2013: 55) [1].

From scholar education, the terminology used to refer to disability, is "students with specific educational needs; students who need a specific educational support". This kind of students has specific educational needs and has to face troubles in the learning process This kind of students has also a high intellectual capacity, and has enrolled late in school or has a personal situation which requires a specific educational attention to make him reach a high level of his personal aptitudes and even the educational aims demanded to every student (Ley Orgánica 8/2013:17179) [4].

Since the great amount of existing terminology on disabled people, it's a challenge for teachers to meet the different demands of students according to the different intervention models which are related to social, educational and sanitary aspects. Teachers need to be properly trained in order to meet the demand of intellectually disabled students in the transitional period to adulthood.

1.2. Teachers Training on Diversity: Development of their Capacities and Communication Skills on Reflection, Collaboration and Personal Inquiry.

After secondary education, young students both from regular and specific education schools, get ready for the working life. They do it at home. Participating actively in different community contexts and feeling socially involved will help them get ready to the working life. These concepts are commonly included in the transitional period to adulthood program from an inclusion perspective (Cobb & Alwell, 2009 [2]; Martínez, 2002 [6]).

The current education law sets out a methodological change from a transversal point of view, which includes social and civil values. In this sense, the principles of 'no discrimination', collaboration and equal opportunities for every student are highlighted.

In this context, in order to establish that principles in students, new specific training actions to adapt educational strategies and inclusion models are essential.

These strategies and models are to suit the interdisciplinary nature faced to the social needs of students at schools and to develop the communication skills of students which are related to positive attitudes for the transitional period to adulthood. These methodological proposals require the development of certain education strategies to facilitate the task of taking decisions and the teaching collaboration structures. In this sense, reflection and personal inquiry has to be suited as a continuous training process through an exchange of teaching experiences and the collaboration of other educational institutions. Thus, it is assumed that a proper teacher training will suit his perception of real education faced to establish a model of teaching competences which suit knowledge, the application of methodologies and solving problems while paying attention to meet the demand of students in the process of transitional period to an active adulthood.

From this methodology, a study to identify other communication skills in teacher training has been carried out. To make it possible, an exchange of teaching experiences as an improvement of permanent training and the development of training competences from a collaborative point of view while paying attention to personal inquiry have been analyzed.

In order to meet the targets to those objectives, different unanswered questions have been set out. The first one is: is the exchange of experiences being carried out in the classroom? The second one is: do teachers consider the need to improve training in the transitional period to adulthood in great diversity contexts?

2. Materials and Methods

The transversal method made by teachers working at schools began through the sending of surveys by different school directors. These surveys were submitted by email to teachers

In the data tables which are included in this article with a 95% confidence interval, every data have been analyzed according to the SPSS Windows statistical package, which is the 17.0 version of the regular IBM program on statistics. This tool has facilitated the statistics report in order to analyze the data obtained in the survey. The data are classified in descriptive data tables. These tables make it easy to classify the data, to carry out segmentation techniques and make a comparison over procedures according to the objectives we want to analyze.

2.1. Survey Respondents

The survey has been responded by 174 teachers from Castilla-La Mancha (Albacete, Ciudad Real, Cuenca, Guadalajara and Toledo). 149 of them have responded the survey on-line and 25 have been interviewed about some important items.

Table 1. Collection of samples

		n	% (IC 95%)*
Tipe of school	Public	68	45.6 (37.4-53.9)
	Privat	44	29.5 (22.3-37.5)
	Do not know/Do not answer	1	0.6 (0-3.6)
	State assisted	39	24.1 (17.5-31.8)
Teaching experience	Less than 5 years	35	23.4 (16.9-31.1)
	From 5 up to 15 years	50	33.5 (26.0-41.7)
	From 16 up to 30 years	39	26.1 (19.3-34.0)
	More than 30 years	11	7.3 (3.7-12.8)
	Do not know/Do not answer	14	9.4 (5.2-15.2)
Specialization of teachers	Therapeutical Pedagogy	16	10.7 (6.2-16.8)
	Hearing and lenguage	8	5.3 (2.3-10.3)
	Employment guidane	17	11.4 (6.7-17.6)
	Proffessional training	4	2.6 (0.7-6.7)
	Social studies	11	7.3 (3.7-12.8)
	Natural sciences	6	4.0 (1.4-8.5)
	Physical education	10	6.7 (3.2-11.9)
	Plastic art and music	16	10.7 (6.2-16.8)
	Others	42	28.1 (21.1-36.1)

This interview as a way to recollect qualitative data has been used as a complement of the information about the exchange of experiences and collaboration. These two processes are linked to reflection by answering the unanswered points of the survey.

Table 2. Sample of the professional profiles of the survey respondents

Number	Teacher profile	Type of school
9	Therapeutical pedagogy teacher	Special Education school
1	Proffessional guiding	Special education school
7	Elementary education teacher	Childhood and Primary education school
1	Proffessional guiding	Secondary education high school
2	Proffessional training teacher	Secondary education high school
5	Secondary education teacher	Secondary education high school

2.2. Measures

This study is about the different tasks that have been carried out by applying a qualitative and quantitative methodology, adapting work from reflection and planning the different data. A large proportion of this work has been made thanks to the participation of the 174 teachers, aiming to shape the reality in an educational and social context. In this sense, some criteria for inclusion and exclusion of the table have been used to complete the table.

2.3. Procedures

In this study, the process from which the survey was made has been taken into account at every primary, secondary and special education school (regardless of their specific features) within Castilla-La Mancha. Before the intervention, information tasks have been carried out by contacting the different public administration services, as well as the school directors and resource people, such as the respondent teachers, to apply the survey via on-line. According to the descriptive research planning, the recollection of information has been carried out through the survey, the interviews and the fact that an expert team has suited dialogue and reflection.

3. Results

The results obtained from the exchange of experiences as a way to improve teacher training reveal 63,1% of them don't share their professional experiences with their colleagues at school and 70.4% don't share them with other teachers outside school. In this context, they paradoxically consider it's important to suit the exchange of experiences for them to improve their training competences. Meanwhile, 88.5% of teachers think that exchange is insufficient in diversity contexts within Castilla-La Mancha.

Table 3. Confidence interval: 95% regularly measured. Intercultural experiences which are carried out are not shared.

ITEM		n	% (IC 95%)*
10.	Do not agree	54	36.2 (28.5-44.5)
	Agree	94	63.1 (54.8-70.8)
	Do not know/Do not answer	1	0.7 (0-3.6)
11.	Do not agree	43	28.9 (21.7-36.8)
	Agree	105	70.4 (62.4-77.6)
	Do not know/Do not answer	1	0.7 (0-3.6)
12.	Do not agree	6	4.1 (1.4-8.5)
	Agree	142	95.3 (90.5-98.0)
	Do not know/Do not answer	1	0.7 (0-3.6)
13.	Do not agree	16	10.8 (6.2-16.8)
	Agree	132	88.5 (82.3-93.2)
	Do not know/Do not answer	1	0.7 (0-3.6)

Regarding the intercultural and methodological proposals in education and other contexts, 89.3% consider the know-how of these proposals essential to improve their professional practice and their training competences in the existing diversity context, Likewise, 92,6% consider the intercultural procedures important to provide different focuses to the teaching- learning models that make clear the need to change and open our minds to new realities and cultural perspectives at school. In the same vein, el 91,3 % consider that proposals even more fruitful applied as a complement of reflection in order to improve the teaching-learning process. 79.2% of the teachers consider training has contributed to personal and joint inquiry, as well as to the application of new teaching-learning strategies and didactic methods according to a diversity context.

Table 4. The exchange of experiences and personal reflection suit teacher training.

ÍTEM		n	% (IC 95%)*
2.	Do not agree	15	10.1 (5.7-16.0)
	Agree	133	89.3 (83.1-97.3)
	Do not know/Do not answer	1	0.7 (0.0-3.6)
6.	Do not agree	10	6.7 (3.2-11.9)
	Agree	138	92.6 (87.1-96.2)
	Do not know/Do not answer	1	0.7 (0.0-3.6)

* Confidence interval 95% regularly measured

In the results obtained regarding the development of teaching competences from the collaboration and personal inquiry model, 91.3% of the teachers consider collaborative reflection as an important aspects to improve their permanent training by applying some strategies on inquiry and communication skills which suit dialogue. For 79.2%, reflection and inquiry help them to carry out comprehension tasks, as well as to apply more creative strategies by using new information they have about social and cultural values and didactic methods which are more and more faced to diversity.

Table 5. By facilitating collaborative reflection, attention to diversity is better

ÍTEM		N	% (IC 95%)*
17.	Do not agree	12	8.0 (4.2-13.6)
	Agree	136	91.3 (85.5-95.2)
	Do not know/Do not answer	1	0.7 (0-3.6)
23.	Do not agree	30	20.1 (14.0-27.4)
	Agree	118	79.2 (71.7-85.4)
	Do not know/Do not answer	1	0.7 (0-3.6)

* Confidence interval: 95% regularly measured

In the same case, 98% of the respondent teachers think that paying attention to the different specific needs of students is suitable for diversity; some processes and strategies are being carried out in order to improve teacher training. 94% think personal inquiry is being suited in order to become open-minded and compromised teachers. 96.6% think creative and reflexive professional practice is being reinforced; they also consider that having the know-how of the teaching practice in diversity contexts reinforces social and cultural values, such as the solidarity coexistence, opening, compromise and common empathy, which are existing demands at schools nowadays. 96% think the specific training on intercultural aspects prepares teachers to pay attention to intercultural diversity; they also think that this is important to acquire new values as tolerance, coexistence, mind- opening, compromise and plural empathy. Likewise, 79,2% agree that this training helps teachers pay attention to diversity; this percentage also think that new researching processes on the professional practice in collaboration with other teachers have been carried out. This processes, as they state, make teachers meet the demand of students in a more compliant and coherent way.

Table 6. Training as a process of personal and collaborative inquiry

		n	% (IC 95%)*
18.	Do not agree	2	1.3 (0.1-4.7)
	Agree	146	98.0 (94.2-99.5)
	Do not know/Do not answer	1	0.7 (0.0-3.6)
19.	Do not agree	8	5.4 (2.3-10.3)
	Agree	140	94.0 (88.8-97.2)
	Do not know/Do not answer	1	0.7 (0.0-3.6)
20.	Do not agree	4	2.7 (0.7-6.7)
	Agree	144	96.6 (92.3-98.9)
	Do not know/Do not answer	1	0.7 (0.0-3.6)
21.	Do not agree	5	3.4 (1.0-7.6)
	Agree	143	96.0 (91.4-98.5)
	Do not know/Do not answer	1	0.7 (0.0-3.6)
22.	Do not agree	30	20.1 (14.0-27.4)
	Agree	118	79.2 (71.7-85.4)
	Do not know/Do not answer	1	0.7 (0.0-3.6)
23.	Do not agree	30	20.1 (14.0-27.4)
	Agree	118	79.2 (71.7-85.4)
	Do not know/Do not answer	1	0.7 (0.0-3.6)

*Asymptotic 95% confidence interval using normal distribution.

4. Discussion

The results obtained in this study are explained in the research on the situation of disabled people, which pays attention to the challenges they will have to face (shown in an overview of the year 2020- Mara ban, Moran, Montserrat and Rodríguez 2012 report) on the training of students on the process “from school to a job"

Another important referent is the education for all monitoring report, which assumes the importance of teaching in education quality. This report also highlights the fact that governments have to contribute to improve teaching competences and allow teachers to take part in the professional decisions in which they are involved (from UNESCO 2015 documents). The different tests that have been checked show the need to take decisions on the situation of disabled students in Secondary education.

5. Conclusions

The analyses show that teachers consider important the development of teaching competences in order to meet the demand of students in the transitional period to adulthood. In this context, a more collaborative pedagogical model, as well as based on personal inquiry, is essential to suit the learning process and exchange interdisciplinary experiences. The analysis of the context reveals that the performances which education carries out on the period “from school to a job” are insufficient. In order to repair this problem, we have new education plans to carry out new methodologies and possibilities for learning in great diversity contexts. Since the enormous size of Castilla-La Mancha, even it would have suited teachers implication, it's been impossible to focus the different respondents in a more personal way.

The respondents contributions can suit the production of teacher competences planning to meet the need of new teaching possibilities and other plans to meet the demand of the working and occupational environment. That's why the challenge for future researches starts from the need to review the permanent training model for teachers from inclusion, which is a way to improve teaching quality.

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Tracking Environmental Sustainability Performance of Public Universities in Kenya

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Abstract Environmental Sustainability Performance Contract (PC) targets were introduced in the 2012/13 financial year as part of the broader public sector reforms and a strategy for performance improvement in the public service that includes Kenyan public universities. However, no evaluation has been conducted to assess performance improvement and impact. The objectives of this study were to; assess the PC targets reporting by public universities in Kenya; assess the authenticity of reporting; establish key challenges in mainstreaming environmental sustainability recommendations; develop an indicative list of environmental sustainability indicators for universities and, compile resources to guide the universities during implementation of environmental sustainability activities and reporting. Data and information were obtained from quarterly reports submitted to the National Environment Management Authority (NEMA) for the 2012/15 period. Proposed indicators were developed from the NEMA guidelines, published sources and online "best practices". Reporting trends revealed an average response rate of 60.2%. The choice of targets was variable, with most universities opting for "soft targets". The top four preferred targets were tree planting (72.7%), developing environmental policy and creating environmental awareness programs (63.6% each), and working with stakeholders to protect and conserve the environment (45.4%). The Vice-Chancellors signed the quarterly reports, confirming authenticity and process ownership. There was no evidence of progressive improvements. Intervention impacts could not be ascertained due to lack of baselines. Key challenges encountered included lack of baseline data and clear implementation strategies, ineffective environmental sustainability committees, inadequate resource allocation for prescribed activities and lack of information and guidelines. Indicators and indicative measurable variables are proposed. Useful resources to assist in the implementation of the PC targets are provided. We recommend expansion of the scope of the environmental sustainability PC targets to address the post-2015 global sustainability agenda by aligning them with the Sustainable Development Goals. Private Universities should be also asked to participate in the environmental sustainability performance contracting with the government.

Keywords Performance Contracting, Campus Sustainability, Sustainability Indicators, Sustainable Development

1. Introduction

Performance Contracting (PC) targets for Environmental Sustainability for Kenyan Public Universities were introduced in the 2012/2013 financial year as a part of the broader public sector reforms for all Ministries, Departments and Agencies (MDAs). Performance contracting was introduced as a strategy for performance improvement in the public service [1]. The objective of performance contracting is "to ensure that performance is measured using international best practices and that performance targets are grown to the extent of placing the country on the cutting edge of global competitiveness". Institutions are expected to ensure that performance indicators are appropriately aligned with the MDAs priority programs and approved budgets [2]. Tertiary institutions are required to submit quarterly performance reports to the government for the purposes of monitoring progress of performance, and for annual evaluation of performance. Environmental sustainability reporting is done through the National Environment Management Authority (NEMA) which provides guidelines to universities on environmental sustainability targets in each annual cycle. The Authority also analyzes the submitted reports and gives feedback to the reporting institutions and the Ministry of Devolution and National Planning.

The performance criteria consist of seven broad areas each with several sub-categories. Environmental sustainability is a sub-category within the "Non-financial category" of the performance criteria.

The universities and other MDAs were required to select four out of eight environmental sustainability targets for implementation during the annual PC cycles. The focal areas for the two financial years from June 2012 to July 2014 and the output/indicators are shown in Table 1 [3, 4]. The ninth target in the NEMA list was on management of waste in counties, urban, townships and market centers which was not relevant to the mandate of the universities and hence is omitted in Table 1.

The government through NEMA prescribed the activities for each focal area and the indicators for verifying the degree of achievement of each target. Although a good start to encourage universities to embrace sustainability initiatives, the proposed indicators (Table 1) were rather general but more importantly, it was not clear how incremental environmental outcomes would be achieved. In other cases, like in the sustainable management of waste, the universities were required to install waste segregation bins. This requirement is in line with best practice but it needs to be supported by requisite policy and resource recovery and recycling infrastructure, which is underdeveloped in the country.

In the 2014/15 financial year, the universities were required to audit their compliance with the Environmental Management and Coordination Act (EMCA) of 1999). An audit checklist was developed covering six broad focal areas each with the key indicators [5]. The focal areas included environmental sustainability planning, pollution control, climate change mitigation and adaptation, environmental and ecological enhancement, environmental education and awareness and, promoting environmental protection and conservation through partnerships with stakeholders. These focal areas are not substantially different from those in Table 1. The difference is that the requirement for the third year was to perform a compliance audit.

Since the introduction of the environmental sustainability performance contract targets for the universities in Kenya, no evaluation has been conducted to assess performance improvement and impact. The objectives of this study were to: conduct a review and analysis of the PC targets reporting by universities; assess the authenticity of reporting; establish key challenges in mainstreaming environmental sustainability recommendations; develop an indicative list of environmental sustainability indicators and, propose resources to guide the universities during implementation of environmental sustainability activities and reporting.

Table 1. Environmental sustainability focal areas (2012/13-2013/14)

Focal area	Indicators	Expected outcomes
Domesticating the environmental policy at the workplace	- Approved Internal environmental policy and implementation plan - Implementation of the environment policy and plan -Quarterly reports	Mainstreaming of environmental sustainability in MDA's activities
Developing and implementing environmental awareness programs	- No. of staff sensitized	Increasing awareness and participation of staff in environmental conservation initiatives
Waste management initiatives	- Segregated bins in place and in use - Disposal of waste as per the waste management regulations - Evaluation criteria incorporating green purchases in the evaluation	Sustainable management of waste
Measures to mitigate all forms of pollution (water, air, noise)	- Application of Licenses under EMCA and other regulations there to -Environmental licenses issued - Annual environmental audit submitted -EIA reports for new projects - No. of EIAs received and comments sent to NEMA - Pollution mitigation technologies in place	The environment protected and conserved
Developing and implementing climate change mitigation and adaptation initiatives e.g. energy saving, water harvesting	- Low energy consumption devices in place -Rain water harvesting structures in place - Use of rainwater for cleaning and watering - Alternative sources of green energy in place	Reduced impacts of MDAs on climate change
Planting trees	No of trees planted, species, and location of the site -Survival rate in %	Increased forest cover
Protection of river banks by enforcing riparian regulations	Length or area restored, secured and conserved in Km or Ha.	Riverbanks and riparian areas restored and protected and conserved
Promoting environmental protection and conservation through partnership with stakeholders	- No. of projects and activities undertaken in partnership - No. of Corporate Social Responsibility activities on Environment	Enhanced protection and conservation of the environment

2. Materials and Methods

A case study research design was used to track and evaluate the mainstreaming of environmental sustainability targets with the institutional operations of 22 public universities in Kenya for the three years since the introduction of performance contracting. Private universities were not included since they were not participating in performance contracting with the government. Data and information for the environmental sustainability reporting was obtained from the quarterly reports submitted to the National Environment Management Authority between 2012 and 2015. It was assumed that all reports submitted to the Authority were made available for this study. A reporting matrix was developed in which the reporting frequency by year and target were developed from the submitted quarterly reports. Email correspondence or telephone calls were made to some universities to confirm authenticity of the reported activities. Authenticity and ownership of the activities and reported outcomes were checked from the submitted reports. The assumption was that it was highly unlikely for falsified reports to be made when the accounting officer in all cases were the vice-chancellors. Appropriate environmental sustainability indicators were developed from three main sources. The first source was the NEMA guidelines for the three years covered in this study. The second source used was published material in the form of books and journal papers. UNEP's [6] toolkit was particularly useful. Thirdly, online resources on "best practices" from leading universities and colleges were used. Care was taken to develop and propose realistic indicators that the universities can successfully undertake given the priorities and resources at their disposal.

3. Results and Discussion

3.1. Number of Universities Reporting

The number of universities which submitted quarterly reports on environmental sustainability to NEMA between July 2012 and June 2015 is shown in Table 2.

Table 2. Response rate for submission of quarterly reports

Quarter	2012/13		2013/14		2014/15	
	No.	%	No.	%	No.	%
1	10	45.4	19	86.4	8	36.4
2	15	68.2	16	72.7	10	45.4
3	14	63.6	17	77.3	9	40.9
4	14	63.6	14	63.6	12	54.5
Average		60.2		75.0		44.3

The expected quarterly reports for each quarter was 22. The average proportion (or response rate) of universities submitting the quarterly reports was 60.2%, 75.0% and 44.3& in 2012, 2013 and 2014 respectively (Table 2). We could not establish the reasons for the very low response rate for the 2014/15 financial year despite the prestigious rankings of ministries, departments and agencies by the government each year. The rather low response rates could be due to financial limitations as the universities do not get additional funding to initiate and maintain environmental sustainability initiatives. There could also be capacity gaps especially in the area of information and guidelines.

Tree planting was the most popular target (72.7%) followed by domesticating the environmental policy at the work place and developing and implementing environmental awareness programs (63.6% each) (Table 3). The target on promoting environmental protection and conservation through partnerships with stakeholders occupied a third position (45.4%). Close to 260,000 trees were planted during the three-year reporting period. However, very few universities reported the reasons for their tree planting activities, tree species planted or the area planted and importantly, the survival rates of planted trees. Theft of tree seedlings by local communities, destruction of seedlings by livestock and inadequate rains were some of the challenges reported by the universities. This suggests that most universities most likely did not allocate adequate resources for post-planting activities and cooperation with local communities to ensure survival of the planted trees. Environmental awareness creation was carried on and off campus through activities such as environmental clean-ups. In many cases, this was a student-led activity which should be encouraged and supported for its experiential learning value to the young generation of environmental stewards.

Table 3. Choice of targets to implement

Target	Frequency	%
Planting trees	16	72.7
Environmental policy	14	63.6
Environmental awareness	14	63.6
Working with stakeholders to protect and conserve the environment	10	45.4
Climate change mitigation and adaptation measures	9	40.9
Waste management initiatives	8	36.4
Pollution	5	22.7
Protection of river banks	4	18.2

The last four targets were selected by less than 40% of the public universities (Table 3). Climate change mitigation and adaptation initiatives involve installation of low energy consumption devices, installation of rainwater harvesting structures and installation of alternative sources of green energy. The likely cost implications in selecting this target could have discouraged most universities. Target on waste management initiatives involved adoption of the 7Rs,

installation of waste bins and segregation of waste, waste collection by service providers who are licensed by NEMA and procurement of goods and services that are environmentally friendly. Most of the reported activities dealt with solid waste but nothing was done on liquid and gaseous emissions which are quite common in institutions of higher learning. Some of the measures reported to have been undertaken included introduction of waste segregation bins, handling of electrical and electronic waste, and reducing and reusing waste. Waste segregation is an excellent strategy for waste management especially when it is associated with resource recovery and recycling. A proper waste management strategy should ideally be based on the characterization and quantification of the types of waste that an institution generates; however, no university reported such studies. Although it is the right direction to take, some of the required actions for this target are difficult to achieve at the moment for most public institutions, let alone the universities. As indicated in the in Section 1, there is no proper waste management infrastructure to support widespread segregation of waste in Kenya. In respect of measures to mitigate against all forms of pollution (water, air, land and noise), the required actions included acquisition of relevant licenses (to discharge wastes in excess of established environmental standards), submission of annual environmental audits and environmental impact assessment reports, if new projects are undertaken, to NEMA and, installation of pollution mitigation technologies. Several of the requirements in this target are straightforward to undertake. However, installing pollution mitigation strategies could have been assessed as a capital-intensive undertaking, hence discouraging many universities from selecting this target. The last target on protection of riverbanks by enforcing riparian regulations, which has the lowest response rate, must have been difficult to implement most likely due to resource constraints on the part of the universities.

3.2. Authenticity of Reporting

The quarterly and annual environmental sustainability reports analyzed for the three-year period were without exception signed by the respective Vice-Chancellors or principals of constituent colleges. Thus, there was ownership of the reported activities and a confirmation that the achievements were made and were genuine. However, there was no evidence of consistency of progressive improvements or follow-up actions on any of the targets chosen. This suggests that the environmental sustainability targets were seen more as discrete targets to be met to satisfy performance contracting obligations with the Government rather than a genuine desire by the Universities to chart a path towards better environmental performance and becoming exemplars of best sustainability practices. Another challenge of the reporting was that the impacts of the various interventions were not assessed and reported on.

3.3. Challenges Experienced in Mainstreaming Environmental Sustainability Targets

There were some challenges experienced in mainstreaming the environmental sustainability PC targets in University operations. The targets were seen as PC compliance issues with the government and not for improved environmental performance for the universities. This is supported by the widespread lack of data on baselines, clear implementation strategies, objectives and outcomes. There were challenges in some institutions in the quality of the sustainability committees in terms of their composition and commitment. In some cases, committee members were appointed without regard to their professional background or responsibility in the university operations. In terms of inadequate commitment, this could be attributed to the fact that being a member of such a committee is in most universities an additional responsibility which might conflict with other mandatory staff obligations like teaching and research. Even where funds were available to carry out prioritized activities, there were delays in the release of funds leading to inadequate resource allocation for the prescribed activities. Most appointed environmental sustainability champions and their members had little or no knowledge and professional experience to implement activities prescribed for the focal areas in the Performance Contract Guidelines. Knowledge about relevant national policies, environmental law, regulations, standards and guidelines were inadequate which might explain the lack of appropriate measurement and impacts of various reported activities.

4. Proposal for Environmental Indicators

The call for universities to engage in best practices for sustainability planning has increased in the recent years. Transforming universities into green and sustainable campuses [6] is a relatively new concept that the Kenya government and partners are introducing to the universities. Most of the public universities have established environmental sustainability committees to assist in the implementation of the PC targets. However, the challenge remains in translating the targets into tangible actions and, the setting up of indicators that reflect progress towards success. For university managers and these committees, indicators of sustainability are useful tools for setting goals and measuring progress. University or campus sustainability indicators have been developed in a number of leading universities in the developed world. Examples include: The Sustainability Tracking, Assessment & Rating System (STARS), which was developed by the Association for the Advancement of Sustainability in Higher Education; The Sustainability Competency & Opportunity Rating & Evaluation (SCORE) developed by Sustainable Measures; and The College Sustainability Report Card, developed by the Sustainable Endowments Institute in the US among many others.

Each university in Kenya is unique in terms of its goals and priorities and each exists in a national, regional and local context [6]. The NEMA environmental sustainability guidelines contain an appreciable number of focal areas and rather general indicators and metrics from which the universities are expected to develop an annual work plan to assist in the implementation of priority areas. It therefore seems logical to develop a set of core indicators which are relevant to all universities. These can be supplemented by additional indicators and measurements which a particular university deems worth tracking on its path towards sustainability. However, it is important to point out that selection of sustainability indicators is best done through a participatory process within the university community. The set of indicators outlined below is therefore indicative only.

Indicators and associated measurable results provide a means to monitor progress towards sustainability [6, 7]. In the various environmental sustainability performance cycles, an attempt has been made to provide performance indicators for each focal area. The selection and definition of the indicators was largely top-down and broadly covered the biophysical aspects of university sustainability (with directly measurable attributes) as well as management indicators (more qualitative). However, the indicators prescribed over the three-year period covered in this paper do not meet all the criteria of an optimal indicator set [6] which include:

- Purposefulness (focused, implementable and meaningful)
- Efficiency (simple, accessible and practical)
- Effectiveness (measurable, relevant, and timely)
- Communicability (clear, transparent and explicit) and
- Responsiveness (adaptable, scalable and replicable).

On the basis of the environmental sustainability performance contracting guidelines and international best practice, the following sustainability indicator set is proposed (Table 4). The indicator set covers eight areas, each with proposed major indicators. Under each major indicator, there can be several sub-indicators. No attempt is made in this paper to provide the metrics required for each indicator, especially for the biophysical aspects of the indicator. However, these can easily be compiled from best practice around the world and appropriately customized to local context.

5. Resources for Performance Contract Targets and Reporting

This part of the paper brings together and summarizes a selected number of resources that may assist universities in identifying and defining environmental sustainability indicators as well as implementing work plans, and measuring and reporting progress. It comprises both printed and online resources with respect to national and international university associations, policies, laws and regulations as well as standards/guidelines. The list is by no means exhaustive but rather a living document that should be updated from time to time to keep abreast of rapid changes and growth.

Table 4. Proposed environmental performance indicators for Kenyan universities [after 2, 3, 4 & 6]

Focal area	Indicative measurable variables
Sustainability in research	Level of grant funding publications, conferences and seminars, commercialization
Education for sustainability	Cross-disciplinary courses, sustainability literacy, curriculum integration of sustainability concepts and principles
Governance and administration	Existence of a university sustainability policy, existence of a sustainability management plan, existence of a sustainability steering committee or equivalent university-wide body that includes the student community, responsibility for oversight of sustainability matters allocated to members of senior management, appointment of a sustainability manager, orientation programs on sustainability for students, academic and operational staff, existence of socially responsible purchasing, disposal and investment practices and policies and regular environmental audits
Community outreach	Service learning, collaboration with other institutions, community sustainable development projects
Energy, carbon and climate change	Assessments of operational energy, embodied energy, transport energy, greenhouse gas emissions
Water use	Potable water, water reuse, rainwater harvesting
Land use	Green buildings, space planning, ecosystem services, biodiversity
Material flows	Contract specification and evaluation, supply chain management, life cycle assessment, waste minimization; reduction in air, soil and water pollution

5.1. University Associations

- **Association of African Universities**: The Association of African Universities (AAU), whose headquarters is in Accra, Ghana, was founded in 1967. Its mission is to enhance the quality and relevance of higher education in Africa and strengthen its contribution to African development (http://www.aau.org/)
- Global Universities Partnership on Environment and Sustainability (GUPES): GUPES is one of the flagship programmes of UNEP's Environmental Education and Training Unit (EETU). At present, over 800 universities and regional partners/focal points from five different continents are part of the growing GUPES network. (http://www.unep.org/training/programmes/gupes.asp)
- **Southern African Regional Universities Association (SARUA)**: Founded in 2005, SARUA is a membership-based organization which is open to all the public universities of the 15 countries that make up the Southern African Development Community (SADC). SARUA currently has 57 members. SARUA was established to assist in the revitalization and development of the leadership and institutions of higher education in the southern African region, thus enabling the regional higher education sector to meaningfully respond to the developmental challenges facing the region. http://www.sarua.org/
- **Association of West African Universities (AWAU):** A sub-regional body Established in 2011, to coordinate and promote the ideals of university education in West Africa with a view to strengthening and developing the leadership of the University Education System in West Africa. http://www.awau.org/
- **Inter-University Council for East Africa (IUCEA):** The IUCEA was formed in 1980 to facilitate networking among universities in East Africa, and with universities outside the region. http://www.iucea.org/

5.2. National Policies, Standards and Guidelines

A number of useful national and county government sustainability policies, standards and guidelines are available in print or electronic form. Although universities are required to comply with the legislative requirements, it is advisable for them to set realistic targets that will ensure compliance and strive even to surpass the legislative requirements. Table 5 contains a number of useful resources. The list is by no means exhaustive and will require updating from time to time.

Table 5. Useful policies, standards and guidelines

No.	Tile	Date issued
1	Biosafety Act No. 2	2009 (Rev. 2012)
2	County Governments Act No 17	2016
3	Environmental Management and Coordination (E-waste Management) Regulations	2013
4	Environmental Management and Coordination (Fossil Fuel Emission) Regulations	2006
5	Environmental Management and Coordination (Noise and Excessive Vibration Pollution (Control)) Regulations	2009
6	National Environmental Policy (Draft)	2012
7	Pest Control Products Act (1985)	Revised 2012
8	Physical Planning Act	Revised 2012
9	The Public Procurement and Disposal Regulations	2006
10	The Public Procurement and Disposal Act	Revised 2010
11	Radiation Protection Act	Revised 2012
12	The Environmental (Impact Assessment and Audit) Regulations	2003 (With amendments in the Fifth Schedule)
13	The Constitution of Kenya	2010
14	The Environmental Management and Coordination Act No. 8	1999
15	The Occupational Safety and Health Act	Revised 2010
16	The Environmental Management and Coordination (Controlled Substances) Regulations	2007
17	The Environmental Management and Coordination (Wetlands, River Banks, Lake Shores and Sea Shore Management) Regulations	2009
18	The Environmental Management and Coordination (Waste Management) Regulations	2006
19	The Environmental Management and Coordination (Water Quality) Regulations	2006
20	Water Act	Revised 2012

5.3. International Agreements and Declarations

The concept of sustainability in higher education was first introduced at an international level by the UNESCO-UNEP International Environmental Education Program in 1978 [8]. A number of declarations relating to environmental sustainability in higher education institutions have been developed, endorsed and signed by a number of universities. Below are examples of some of these declarations:

Talloires Declaration: Composed in 1990, this is the first official statement made by university administrators of a commitment to environmental sustainability in higher education. The Talloires Declaration is a ten-point action plan for incorporating sustainability and environmental literacy in teaching, research, operations and outreach at colleges and universities. As of January 2016, total signatory institutions had reached 499 from over 50 countries. The University of Nairobi and Moi University have signed the declaration (http://www.ulsf.org/programs_talloires_signatories.html#top).

The Higher Education Sustainability Initiative (HESI): HESI was created as a partnership of UN entities (UNESCO, UN-DESA, UNEP, Global Compact, and UNU) in the run-up to the United Nations Conference on Sustainable Development (Rio+20). With a membership of almost 300 universities from around the world, HESI accounts for more than one-third of all the voluntary commitments that came out of Rio +20(https://sustainabledevelopment.un.org/index.php?menu=1073).

The Nagoya Declaration on Higher Education for Sustainable Development: This was adopted by the participants of the International Conference on Higher Education for Sustainable Development in Nagoya, Japan on 9 November 2014. It reaffirms the responsibility of higher education for pursuing sustainable development and commits their support to further advancing sustainable development through education for sustainable development. Link: http://www.c-linkage.com/for/hesd/declaration.html

5.4. Books and Journals

There is a growing body of published literature on practical experience and theoretical development on the sustainability imperatives of organizations such as universities. This literature includes books, journals and considerable on-line resources. The key aides to universities include, among others, the greening universities tool kit developed by UNEP [6] and the book by Brady [9] on environmental management in organizations.

The Journal of Cleaner Production: A trans-disciplinary forum for the exchange of information and research concepts, policies, and technologies designed to help ensure progress towards making societies and regions more sustainable. It aims to encourage innovation and creativity, new and improved products, and the implementation of new, cleaner structures, systems, processes, products and services. It is also designed to stimulate the development and implementation of prevention oriented governmental policies and educational programmes. Cleaner production is a concept that goes beyond simple pollution control. It involves active research and development into new structures, systems, processes, materials and products that are more resource and energy efficient, whilst engaging and empowering people. Such approaches have become necessary for businesses, institutions, governments, and civil society to ensure ecologically, socially, and economically sustainable, consumption production and service strategies. These involve educational, training, management, and technical assistance programs, which are needed to accelerate the adoption of cleaner production and sustainability by industries, governments and universities.

https://www.journals.elsevier.com/journal-of-cleaner-production

Sustainability Science: The journal provides a trans-disciplinary platform for contributing to building sustainability science as a new academic discipline focusing on topics not addressed by conventional disciplines. As a problem-driven discipline, sustainability science is concerned with addressing practical challenges caused by climate change, habitat and biodiversity loss, and poverty among others. At the same time, it tries to investigate root causes of problems by uncovering new knowledge or combining current knowledge from more than one discipline in a holistic way to enhance understanding of sustainability. The journal provides a multidisciplinary forum for communication among researchers, policy makers, practitioners, educators, and the young generation. http://link.springer.com/journal/11625

International Journal of Sustainability in Higher Education: The journal addresses the need for documentation and the dissemination of research, studies and projects on sustainability matters among higher education institutions. It provides information on new developments and trends, and provides a platform for networking and information exchange on a global basis. http://www.emeraldgrouppublishing.com/products/journals/journals.htm?id=ijshe

5.5. Online Tools and Resources

There is a growing list of online resources to assist universities to implement and measure progress in sustainability programs and projects. They include self-assessment reporting frameworks and questionnaires, guidelines and case studies [6]. Most university associations (e.g. AASHE) provide some of the best practice case studies and checklists for reference [6]. The list below gives a brief description of some of the well-known tools and the links for more information:

- **Charter & Guidelines** which was developed by the International Sustainable Campus Network (ISCN). The Charter was developed to support universities in setting targets and reporting on sustainable campus development goals and performance against the three principles of the ISCN which include (1) buildings and their sustainability impacts, (2) campus-wide planning and target setting, and (3) integration of research, teaching, facilities and outreach (http://www.international-sustainable-campus-network.org/charter-and-guidelines)
- **Sustainability Tracking and Rating System (AASHE STARS):** STARS This was developed by the Association for the Advancement of Sustainability in Higher Education. It is a transparent, self-reporting framework for colleges and universities to measure their sustainability performance. The tool is designed to: provide a framework for understanding sustainability in all sectors of higher education, enable meaningful comparisons over time and across institutions using a common set of measurements developed with broad participation from the international campus sustainability community, create incentives for continual improvement toward sustainability, facilitate information sharing about higher education sustainability practices and performance and, build a stronger, more diverse campus sustainability community.

  https://stars.aashe.org/pages/about/stars-overview.html
- **The Sustainability Assessment Questionnaire (SAQ)** is designed to assist in assessing the extent to which the college or university is sustainable in its teaching, research, operations and outreach. "Sustainability" implies that the major activities on campus are ecologically sound, socially just, economically viable and humane, and that they will continue to be so for future generations.

  http://www.ulsf.org/pdf/SAQforHigherEd09.pdf
- **Sustainable Development on Campus: Tools for Campus Decision Makers**: These tools will help decision makers at universities learn more about sustainable development and "green" campuses. There are learning modules, case studies, action plans, environmental policies, resources, forums and contacts intended to help administrators, students, or faculty members implement sustainable development on their campuses. Topics include declarations of commitment to sustainable development by academic leaders, a review of sustainable development and ideas for integrating them into curricula and practices, and sample policies for implementing sustainable development

  http://www.iisd.org/educate/
- **Teaching and Learning for a Sustainable Future (A UNESCO site): T**his is a multimedia, interactive professional development program with materials, exercises, and links that help educators deepen their understanding of education for sustainability and its importance in addressing the economic, social, and environmental issues of the world. This site presents key educational issues that form the rationale for Education for a Sustainable Future (ESF), including: A basic understanding of sustainable development; help in understanding the range of social, economic, and environmental issues facing the world today; the interrelationships among these different types of issues; and the ways that education is key to the empowerment of people working for a sustainable future; The site also includes "Future studies," which explore different ideas and perspectives about the future and include exercises designed to examine personal views as well as writings by futurists, consider probably versus preferable future scenarios, and incorporate these ideas into the curriculum; and various strategies for the education community to reorient education toward the broader process of building a sustainable future.

  http://www.esdtoolkit.org/resources/web_esd.htm
- **Campus Sustainability Toolkit**: This tool was developed by the International Alliance of Research Universities (IARU) in 2009 with the aim of promoting collaboration between member institutions, and developing best practice strategies in environmental management. This toolkit is based on the experiences of the IARU members in creating and maintaining a sustainable campus. This toolkit is especially useful for universities that are beginning their sustainability journey. Most importantly, it highlights the importance of active participation of staff and students for the achievement of sustainability goals.

  (http://www.iaruni.org/sustainability/campus-sustainability)

The objectives of this study were to conduct a review and analysis of the PC targets reporting by universities; assess the authenticity of reporting; establish key challenges in mainstreaming environmental sustainability recommendations; develop an indicative list of environmental sustainability indicators and, propose resources to guide the universities during implementation of environmental sustainability activities and reporting. The first objective dealing with analysis and PC targets reporting was addressed using data and information for the three years from 2012/13 to 2014/15 as shown in Section 3.1. The second objective on authenticity of reporting was achieved via the analysis of all the reports to establish ownership by top management as well as contacting some universities for confirmation of certain activities. The third objective was

achieved through analysis of the submitted reports which had a provision for explaining the reasons for variance between targets and what each university achieved in a particular reporting cycle. In the last few years, a number of universities particularly in the developed world, international organizations such as UNEP, industry and business organizations have developed and tested environmental sustainability indicators and useful resource guides. These diverse sources well helpful in the realization of the last two objectives as elaborated in Sections 4 and 5, respectively.

6. Conclusions

The environmental sustainability PC targets have so far targeted public universities yet, Kenya has a good number of private universities some of which are undertaking sustainability initiatives. The sustainability targets so far appear to be requirements by the government rather that a genuine desire by the universities to reduce their ecological footprint and to be examples to internal and external communities as leaders in sustainability initiatives. The sustainability committees are not effective in their mandate perhaps due to their selection and motivation, as well as lack of information and guidelines. It is also clear that few universities have a budget line for environmental sustainability initiatives. Most universities lack baselines and continuity of initiated activities. Hence, the impacts of these activities are difficult to assess and report on. The level of involvement of students and other stakeholders is weak in almost all universities. It is also evident that there is lack of common metrics for measuring progress and for facilitating comparison

To encourage and empower universities to play their role in sustainability planning the universities that do not have an environmental sustainability policy and a well constituted committee to oversee its implementation should do so. Private universities in Kenya should also join the public universities in implementing and reporting on the PC environmental sustainability targets. It is recommended that they should be recruited into the newly established Kenya Green Universities Network.

Finally, the universities should become more proactive and expand the scope of the prescribed environmental sustainability targets in order to strategically address the post-2015 global sustainability agenda by aligning their commitments and activities with the Sustainable Development Goals.

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Technical Education – The Key to Sustainable Technological Development

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Abstract Technical education has been identified as one of the most effective human resource development that needs to be embraced for rapid industrialization and sustainable technological development of any nation. Technical education has been an integral part of national development in many societies because of its impact on productivity and economic development. This paper discusses the dearth of skilled technical manpower in Nigeria and its effect on the technological development of the nation. It advocates for a comprehensive revitalization of technical education in Nigeria to promote workforce partnership needed to develop innovative approaches or replicate models that operationally demonstrate has demand technological the society needs. Efforts and ways by both by the government and individuals to train and produce the required manpower for the achievement of vision 20, 2020 objectives were also suggested by the authors.

Keywords Technical Education, Sustainable Development, Economic Development, Skilled Manpower, Industrialization, Technological Development

1. Introduction

Technical education is education that prepares people for specific trades, craft, technical or a professional position in engineering, accountancy, nursing, medicine, architecture, pharmacy, law etc. Craft vocations are usually based on manual or practical activities, traditionally non-academic related to a specific trade, occupation, or vocation. It is sometimes referred to as vocational education as the trainee directly develops expertise in a particular group of techniques [1, 2 & 3].

Technical education may be classified as teaching procedural knowledge. This can be contrasted with declarative knowledge as used in education in a usually broader scientific field, which might concentrate on theory and abstract conceptual knowledge, characteristic of tertiary education. Technical education can be at the secondary, post-secondary level, further education levels and can interact with the apprenticeship system. Increasingly technical education can be recognized in terms of recognition of prior learning and partial academic credit towards tertiary (e.g. at a university) as credit, however, it is rarely considered in its own form to fall under traditional definition of higher education.

Technical education is related to age-old apprenticeship system of learning. Apprenticeships are designed for many levels of work, from manual trades to high knowledge work. However as the labour market becomes more specialized and economies demand higher levels of skills, government and businesses are increasingly investing in the future of technical education though publicly funded training organization and subsidized apprenticeship or traineeship initiatives for business. At post-secondary level, technical education is typically provided by an institute of technology polytechnics, university or by a local community college.

Technical education has diversified over the 20th century and now exists in industries such as retail tourism, information technology, funeral service and cottage interties [4 & 5]. Technical and vocational education (TVE) has been an integral part of national development strategies in many societies because of its impact on productivity and economic development. Despite its contributions, the leaders of Nigeria have not given this aspect of education the attention it deserves. This is one of the reasons for the Nations underdevelopment. This paper discusses technical education as "the key to sustainable technological development".

1.1. Technical Education and Technological and National Development

a Technical education "is a planned programme of courses and learning that begins with exploration of

career potions, supports basic academic and life skills, and enables achievement of high academic standards leadership, preparation for industry defined work, and advanced and continuing education;

b Technical and vocational education and training "prepares learners for careers that are based in manual or practical activities, traditionally non-academic and totally related to a specific occupation of vocation in other words, "it is an education designed to develop occupational skills".

c Vocational and technical education gives individuals the skills to live and work is a productive citizen in a global society.

2. History of Technical Education

The provision of vocational and technical schools has a long history. Before the industrial revolution (1750-1830) home and the 'apprenticeship system" were principal sources of vocational education but societies were later forced by the decline of handwork and specialization of occupational functions to develop institutions of vocational education [6].

Manual training that involves general instructions in the use of hand tools was said to have developed initially in Scandinavia (c. 1866). However, vocational education became popular in the elementary schools in the United States after 1880 and developed into course in industrial training, book keeping, stenography and skilled commercials works in both public and private institution.

The United States of America is not the only society that appreciates skills acquired through vocational and technical education, the Dutch school system is said to pay attention to "high standards in mathematics and the provision of vocational education at ages 14-16 for a third of all pupils, and widespread vocational education at 16+ [7 & 8].

Secondary (high) school in many other development concerns nations have vocational centers that offer vocational training for lifelong trade together with general academic studies. For instance, India and the "Asian Tiger" could not have become what they are without massive investment in technical education. However, because of recent changes in the world economy many vocational and technical schools have shifted emphasis to training in the computers and information technology [7 & 9].

While technical and vocational education has continued to thrive in many societies, Nigeria has neglected this aspect of education. In Nigeria, technology education was preciously not seen as fundamental for national development, or for the economic development, but for the schools dropouts and other social and political development within the nation and for individuals. However, [10] had argued that technology education is linked to human resources development and that this has an impact on more than just economic growth but also an impact on the wider development of individuals and societies.

The neglect of technical education is socially and economically injurious because it is robbing the nation the contribution the graduates would make on national development. Consequently, the society lacks skilled technicians: bricklayers, carpenters, painters, auto-mechanics, laboratory and pharmacy technicians, electrically electronic technicians, and skilled vocational nurses, etc.

3. Technical Education and Sustainable Development

The development of any nation hinges on the socials and economic contributions of her citizens Education, vocational and technical training play a major role at promoting community and national development [11]. Vocational and technical education promotes and facilitates the acquisition of applied skills and basic scientific knowledge. It is planned programme of course and learning experiences that begin with the exploration of career options, supports basic academic and life skills and enables the achievement of high academic standards, leadership, preparation for industry and continuing education [5].

It cannot be over emphasized that technical education is the engine of economic growth. No nation can fight a war without the army. In the same vein, Nigeria cannot develop without well-equipped technical and vocational institutions. Unfortunately, Nigeria does not seem to give vocational and technical education the attention it deserves. Technical Education has been described as the "missing link" in Nigeria development policy [12]. Because of poor training and ineffective institutions, Nigeria suffers from low productivity in all aspects of economic and technological endeavours. This appears to be one of the reasons for rising rate of unemployment and poverty in the society.

The growing problem of unemployment in the country has contributed largely in the worsening problem of poverty among the populace. This is because the youths and graduates from tertiary institutions are not equipped with adequate skills that will enable them to exploit the natural resources that abound in Nigeria. Scholars like [13], posits that unemployment leads to frustration and disillusionment which may result in crime or drug abuse in a futile attempt to escape from humiliation and insults associated with poverty and lack. The problem of unemployment, he further stated has worsened as millions of school leavers and graduates of tertiary institutions are not gainfully employed. The reason is that they lack the necessary skills that would enable them to be self-employed and effectively function in today's world of work. However, [3] in stressing the importance of technical education asserts that technical and vocational education in a comprehensive term refer to those aspects of education process in evolving the acquisition of practical skills, attitude, understanding and knowledge relating to occupations in various sectors of economic and social life.

Technical education if given the required attentions needed, it can alone transform the nation into one of the leading country in ICT and economic development because of much benefits embodied in it. Some of these benefits include:

a **Creation of employment opportunities:** The issue of unemployment will remain a problem to Nigeria for many years if people are not trained/ educated on how to be self-employed. Technical education is the only sure tool of fighting the rate of unemployment in the country. This can be achieved through educating the people on how to use their brain, body and hands to engage themselves in different productive activities to earn good money and live fulfilled life.

b **Income/revenue generation:** Technical education has its ways of boastings the economy of the nation through empowering the people technically in one field or the other. For instance, if a man has been trained to manufacture/produce car parts at the end of the day, he will pay his tax to the government and also have some left for his livelihood and maintenance of his household.

c **Enhancing people's standard of living/poverty reduction:** Technical education improves people lives and living standard through training the youths in useful skills, engaging them in productive works, generation of income and reduction of security votes by the government, creation of employment opportunities thereby increasing the economic and social standards of the citizens.

d **Nation's self-independence:** If the concept of technical education is properly employed with all its relevance benefits in no distant time Nigeria will not only be independent economically and technologically but will also be among the leading country in ICT and export of goods and services in the world and several ugly and embarrassing situations will be addressed.

4. Challenges of Technical Education in Nigeria

It is obvious despite the numerous benefits that come with technical education in national development; we are still having problems in bringing it to lime light as a result of poor policies and corrupt leaders. As a developing nation, if we can channel our efforts in addressing this issue then we can believe that he sky will be our limit. The challenges militating the training of technical education personnel, technicians and technologists are many but a few of the major ones are highlighted below.

a **Poor funding:** The funding of technical and vocational education programme is very poor and inadequate. The success and developmental advancement in technical and vocational education which have been actualized over the years has been frustrated as a result of poor funding [14]. Financial sustainability facilitates the development of knowledge which requires innovative measures so as to ensure that the public vocational and technical education colleges/institutions are not deprived of the much needed resources for their future expansion [8].

b **Acute shortage of vocational technical teachers:** Many of the trained technical teachers because of the neglect on them as regards remuneration and incentives have moved from schools to the industries and sometimes to developed countries where they get better pay for their services. Some teachers and students who leave the country to acquire more knowledge and skills at the end of their training refuse to return to the country because of poor attention to technical teachers by the government and the public. Also some skilled professionals abandon the practice of technical education in favour of other more lucrative economic activities and political appointments which are not related to their training.

c **Inconsistent Government Policy on Technical and Vocational Education:** Inconsistency in the formulation and implementation of technical and vocational education policies has been a major setback to the advancement of technical and vocational education. Lack of follow-up and continuity in government and her ministers or commissioners of education as a result of selfishness and corruption has been one of the key factors facing technical education and national development.

d **Lack of Adequate Training Facilities and Equipment:** Most technical colleges in Nigeria do not have laboratories or workshop space let alone useable equipment and facilities. Where they exist, they are grossly in adequate and obsolete, as the laboratories only have the items or equipment that were provided when the colleges were established. Most technical colleges cannot boast of adequate functional workshops and laboratories even when the teachers may be ready to teach the students in spite of the poor remuneration. There are some cases where technical equipment/machines were supplied but no workshop to install the equipment. This certainly will lead to frustration on the part of the technical college teachers, students and parents.

e **Staff Training, Re-training and Retention:** Most technical teachers have poor training background owning to the problem encountered during the training process. Most technical teachers in our technical colleges have never since their practice gone for re-training program in order to keep abreast with the ever-dynamic technical innovations associated with the ever-ending needs of the society. The training of technical teachers is ordinarily a continuous exercise to ensure consistent improvement in the quality of their

output. This training can be acquired locally or otherwise. Usually local training is cheaper but more strenuous because of inadequate facilities and literature overseas training requires a lot of foreign exchange but the enabling environment help to achieve success in record time. However, overtimes it has always been difficult to get the trainees back to Nigeria after the completion of their study.

f **The Curriculum of Technical Education:** The curriculum of a subject with practical content is generally organized into an average of 67% for the theoretical classes and 33% for laboratory or workshop. Students also use the laboratory to develop case examples on their own time. Again, [15] noted that one of the issues confronting the design of appropriate curriculum for technical education is preparing students for the shift from florist to Information and Communication Technology (ICT) paradigm in technical practice. The curriculum for technical education in Nigeria has remained under the focus of the colonial masters, i.e., foreign model which has evolved under ideal condition (staff, equipment, infrastructure, training opportunities, etc), that are not easily duplicated in development countries. The low pace of industrialization and technological growth in Nigeria can be attributed to the widening gap between science and technology as a result of the inability of technical education program to adequately utilize the scientific-ideas to promote technology.

g **Mal-administration:** Most of the problems encountered in the field of vocational and technical education programs in general are grossly caused by poor planning, administration and management [16], noted that by far, the greatest obstacle to a rapid acquisition of technology in poor countries could be traced to the types and quality of management system prevalent in these countries, whereas in developed counties all managers of private and public sectors are technically trained. Technical managers in developing countries are essentially managers who have grown without any technical background and training. It is quite evident that in Nigeria those who know little or nothing about ethics of vocational and technical education programs are meant to man such establishment. For instance most times you may find ministers and commissioners of education as lawyers, accountants, priests, medical doctors, engineers, etc. This has a lot of negative tendencies to our development program/initiatives.

Other problems associated with vocational and technical education in Nigeria may include; gross neglect, lack of well-equipped library for research work/project, poor professional, personal and public images lack of adequate motivation, decline in student's enrolment, lack of use of modern technology/information technology for teaching and learning, use of poorly qualified technical staff, unemployment, lack of entrepreneurship education, lack of adequate security/security needs, etc.

5. Revitalizing of Technical Education

This is procurable via:

a **Mandatory Continuing Professional Development (MCPD):** There is provision in the National Policy on Education (NPE) 4th Edition [17] relating to the Mandatory Continuing Professional Development (MCPD). An individual shall be able to choose between continuing full time study, combining work with study or embarking on full time employment without excluding the prospect of resuming studies later on. Professional development avails teachers the opportunity to develop, update and demonstrate their profound competence against set standards. This is absolutely essential for the strength, vibrancy, updating and future of the teacher profession.

b **Adequate Funding:** The political will and national co-operation in terms of funding is fundamental and non-negotiable to revitalization of technical education in Nigeria which is the major obstacle of the development of technology, industrial and economic growth of Nigeria. Effective teaching and learning of technical and vocational education requires adequate funding to build more new classrooms, laboratories/workshops, provide facilities and equipment/machines/ tools.

c **Use of Information Technology for Teaching and Learning:** Information technology (IT) is affecting education in revolutionary ways and the momentum is irreversible. Information and Communication Technology has to be incorporated as part of teaching and learning tools in technical and vocational institutions to harness the advantages of educational delivery. The visual library as a platform for sharing knowledge is aimed at rejuvenating Nigerian schools through the provision of current textbooks, journals and other information sources using digital technology.

d **Retraining of Technical Education Teachers:** The generality of the people are becoming aware of the economic value/benefit of technical education as the avenue for turning the economy and technology around. According to [15], the Federal Government's recognition of vocational and technical education as a powerful tool for technological development has created public awareness of the indispensability of this aspect of education. This is seen through the establishment and expansion of more institutions of vocational and technical education to provide needed manpower in the sector. The technological teachers training programmes (TTTP) introduced by the Federal

Ministry of Education is a deliberate attempt to brighten the future of technical and vocational college teachers by sponsoring them to higher heights of the ladder in their profession. Seminars, conferences, workshops, etc should be organized for technical teachers periodically so as to be acquainted with the ever-changing technological innovations.

e **Campaign towards Vocational and Technical Training:** Vocational and technical education has been neglected for a long time because of the negative perception of those who should project and nurture it to maturity. The negative attitude of many people, parents and students to vocational and technical education should be hanged by all and sundry. The government, educationist, teachers and students alike should carry out a campaign or orientation program towards enlightening the general public/citizens on the need for their children to be vocationally and technically oriented in light of the prevailing economic circumstances of the nation. Unemployment and poverty level are on the increase. Technical education will aim to cater for all and sundry, through their manipulative skills acquired.

f **Professional Diploma in Education:** All teachers in educational institutions shall be professionally trained. A one year professional diploma in education has been suggested for all teachers in educational institutions. Former Technical Registration Council of Nigeria (TRCN) now National Board for Technical Education (NBTE) has been mandated to structure the diploma program to equip technical teachers without teaching qualifications for effective performance of their duties. This will facilitate the extension of the best professional development programs to the teachers.

g **Encouragement of Research, Inventions and Innovation:** Everyone who cherish genuine growth and sustainable development, government, private and corporate organizations, non-governmental organizations and individuals should as a matter of due responsibility encourage and finance research activities/programs, skills acquisition, inventions, innovations and mass production of invented products. This will help the development of interest in technical and vocational education which is the engine for skills acquisition, creativity, research, invention innovation and entrepreneurship that promote technological and economic activities for sustainable development of the nation.

h **Incentives to Teachers and Students of Technical and Vocational Education:** Technical college teachers are most often subjected to deplorable conditions. Hardly are they found in furnished offices, instead they are put in large staff rooms, a times with students type of lockers or desks and chairs, whereas their counterparts in other sectors could have executive air-conditioned offices, private secretary or even messengers, cars and reserved parking spaces. They could belong to prestigious clubs and associations because of better salaries. Salaries of technical education teachers should be increased to certain level or equal to their counterparts in industries and other sectors to boast their moral. Also other incentives such hazard allowance, overtime, workshop/seminar/conference sponsorship should be given to them for encouragement and support. Moreover, students of technical colleges should be given scholarship by the government and the philanthropists, free medical care; free safely wears, free textbooks and free access to e-library as an encouragement or incentives.

6. Conclusions

Technical education holds the key to sustainable national development. Technical education programmes in Nigeria has not attained the maximum performance of its potential roles of national economic and technological development. The neglect by the government, private and corporate organizations outlook of the society and other variables hinder its development and contribution to social and economic growth. Nigeria cannot develop without well-equipped technical and vocational institutions. In fact, according to [18], it is the missing link in Nigeria's development policy. Because of poor training and ineffective technical institutions, Nigeria suffers from low productivity.

However, the progress of any society lies in the productivity of its citizens. Higher productivity gives a nation advantage of economies of scale and lowers the costs of production and prices of goods and services. It is technical education that can give the technological skills required to keep pace with the speed of global transformation technological and economically. This cannot be achieved, except through a complete revitalization of technical education, in Nigeria, with the emergence of strong and vibrant activities that are developmental and technological oriented.

Nigeria should begin now to take very seriously investment in technical education and skill acquisition as no nation can compete effectively in the global market with poorly educated and skilled manpower. The leading factors of production in the emerging global economy are said to be technology, knowledge, creativity and innovation.

Finally, the nation's vision 20, 2020, the Seven-Point Agenda and the transformation Agenda – President Goodluck Jonathan's ROADMAP to Nigeria's development will remain a paper tiger without the turn around to technical and vocational education.

7. Recommendation

In view of the problems highlighted in this paper, the

authors hereby recommend that:

i. The Federal, State and Local Governments should compulsorily make vocational and technical education subject foundation programs institutions across the country. This is to enable all individuals the opportunity to understand and appreciate the important of this laudable program to the development of every individual and the nation.

ii. The curricula of technical education should meet the needs of modern industries and should be at par with international standards.

iii. Emphasis should be made on the practical aspect of technical and vocational education which will help to produce productive members of the nation's labour force that will be self-reliant or employable in industry or company.

iv. Government should provide adequate facilities to technical college workshops and laboratories using current strategies identified to ensure acquisition of relevant skills, knowledge and experience that are relevant to the growth of the country.

v. Non-governmental organizations (NGOs), industrialists, philanthropists, parents-teachers association (PTA) and community based organizations (CBOs) should be sought for support in supplying/provision of relevant facilities, equipments/machines as obtained in some nations.

vi. Enough funds should be made available by the government to technical education institutions from the Education Trust Fund for the procurement of tools, equipment, training materials and infrastructural facilities the allocation and release of such funds should be properly monitored and utilized to avoid leakage of funds.

vii. Quality and modernization focused technical education. Technical education structure requires sound management skills based on innovation, adaptability and effectiveness. Continuous professional development schemes and tools should be established throughout the system for re-training of staff in all facets of technical education. More modern learning aids such as computers, internet, website facilities, overhead projectors, firms on technological development/training, etc, should be provided in schools. E-learning and long distance training, geared to technological advancement, professionalism in the globalization era should be developed to accelerate the upgrading of skills and transfer of knowledge among the staff and students.

viii. Finally, awareness of the importance of technical education should be increased, because the development and growth of technology and economic activities for the nation's advancement depends on technical education. The media should be used to disseminate information about the value of technical and vocational education to the public. This would definitely help in improving Nigerian's culture and attitude to technical education and national development.

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Examination of the Views of Class Teachers Regarding the Errors Primary School Students Make in Four Operations[i]

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Abstract Teaching of addition, subtraction, multiplication and division in mathematics starts from the first years of primary school. The learning output for four operations (addition, subtraction, multiplication and division) affects student success at every level of mathematics education from primary to higher education. At this point errors, misunderstandings and possible misconceptions of students need to be identified, eliminated, and the forms of instruction that prevent its formation need to be investigated. This study aims to identify the errors primary school students make in four operations according to the views of class teachers. The study was designed in the qualitative research design and the semi-structured interview form prepared by the researchers was used in the study. The study group consisted of 48 class teachers. It has been found out that students make more errors in adding, subtracting and multiplying decimal digits, and using zero in division. In addition, classroom teachers stated that the mistakes made in four operations result mostly from student, teacher, program and the student's family and environment respectively. Teachers made course content, teacher, student and family oriented suggestions to eliminate the mistakes in four operations.

Keywords Errors, Primary School, Four Operations, Addition, Subtraction, Multiplication, Division, Class Teacher

1. Introduction

In our daily life, the need to use and understand mathematics is gaining importance and is constantly increasing. In a rapidly changing world, individuals who understand mathematics, use it in their lives and succeed in mathematics have more options in shaping the future [1, 2, 3]. With the changes that occur in our lives, mathematics and mathematics education need to be redefined and considered in line with the needs determined [4].The changes that take place in the direction of the needs in mathematics education are reflected in the teaching.

The basis of mathematics teaching is the teaching of mathematical concepts. The concepts in mathematics follow a sequential and gradual sequence. For this reason, it is absolutely necessary to know what the mathematical concepts are, and more precisely, what they will be used for. Otherwise, knowing only abstract definitions cannot make meaningful learning happen. In order for this kind of learning to be possible, the relations of the mathematical concepts with the lower and upper concepts and their connections with each other must be revealed [5]. Mathematics program is based on the principle that *every child can learn maths*. Mathematical concepts are abstract in nature. When the level of children's development is taken into consideration, direct perception of these concepts is quite difficult. For this reason, concepts related to mathematics have been dealt with by way of concrete and finite models of living. In the program, importance is attached to the conceptual learning as well as the operation skills [4].The teaching of concepts has an important place in the curriculum and there are different achievements from pre-school to the last grade of primary school for these concepts [6].

The understanding of a mathematical subject does not take place suddenly. It is a continuously evolving process which is reached at the end of the learning program [7]. It is a different process from the perception that is about the 'right' and 'wrong' answers in mathematics. It is certain that wrong answers are a difficulty known by everyone. We all have misconceptions; but labelling them as 'wrong' is unrecognizing these misunderstandings [8]. Misconceptions are often found in mathematics. These misconceptions occur throughout a child's education. Some take place due to the

nature of the child; others are the results of the teaching technique. Researchers agree that it is difficult to overcome many misconceptions [9, 10, 11]. For this reason, before misconceptions occur, teachers must be aware of the causes of misconceptions that can occur in children's minds. The misconceptions that have been noticed should be focused on by studying more and doing examples [12]. Students experience difficulties when they have an incomplete or incorrect learning about mathematics, and this problem is reflected in the student's future education. Hence, problems occur in the upper learning of the student. As long as these problems remain unsolved, incomplete or incorrect learning in students becomes a misconception [13].

It is important to determine the difference between error and misconception. Both result in wrong answers. The reasons for the difficulties the child experiences will require different answers. An error can result from a misconception [14]. Errors can be made for many reasons. This can be the result of inattention, an instant pen shift, misinterpretation of symbols and texts, lack of experience, understanding and knowledge about mathematical subject, target and concept, lack of awareness and inadequacy in controlling the answer or misconception [15, 16]. Misconception is the product of a lack of understanding, and in most cases is a constant misjudgement of a rule or mathematical generalizations. When we look at a completed work, the best way to understand a misconception or other cause of an error is the frequency and consistency of the error [14]. On the frequency and consistency of errors, Cockburn [15] noted that common mathematical errors stem from teachers, students, and subjects. He revealed that the maths errors originating from the teacher and the student are caused by experience, expertise, knowledge and understanding, imagination and creativity, attitude and confidence and psychological situation. In addition, Cockburn [15] notes that mathematical errors stemming from the subject have occurred due to presentation, expressing and difficulty of the subject.

Errors and misconceptions constitute a barrier to children's learning mathematical concepts. As a result, it leads to low mathematical success. When mistakes and misconceptions are considered positively, these mistakes and misconceptions must be corrected and students should be assisted in the development of mathematical knowledge in their educational process. It is also important that teachers give instant feedbacks. Teachers play an active role in the causes of students' errors or in the wrong generalizations they make and in correcting them to reach the correct way [17].

The teaching of the four operations in mathematics education starts from the first years of primary school and four operations constitute the basis of many subjects that students will encounter during their education life. The learning output for four operations affects student success at every level of mathematics education from primary school to higher education. At this point errors, misunderstandings and possible misconceptions of students need to be identified, eliminated, and the forms of instruction that prevent its formation need to be investigated.

1.1. Objective of the Study

This study aims to identify the errors primary school students make in four operations according to the views of class teachers. In the study, primary school students' errors in the addition, subtraction, multiplication and division were investigated. In addition, the researchers tried to get teachers' opinions about the causes of students making mistakes and the work done in eliminating these mistakes. It is important for pupils to acquire four mathematical operations in primary school and it is very important to determine the errors made in four operations and the causes of errors in order to make the teaching effective and to gain the aims. Starting from here, the sub-objectives of the research are as follows.

According to the views of primary school teachers, what are the errors primary school students make;

1. in the addition?
2. in the subtraction?
3. in the multiplication?
4. in the division?
5. What are the causes of errors in four operations (addition, subtraction, multiplication, division)?
6. What are the solution offers of teachers to solve the errors in four operations (addition, subtraction, multiplication, division)?

2. Materials and Methods

This section contains information on the pattern of the study, the study group, the data collection tool and the analysis of the data.

2.1. Study Pattern

The research was structured in accordance with the basic interpretive qualitative research design. This pattern, which can be used in all disciplines and application areas, is widely used in the field of education [18]. The basic interpretive qualitative research involves participants' experience, their perceptions in the process and their perceptions of their experiences. During the research process, the researcher intends to deeply understand the phenomenon, process, perspectives and world views of participants [19]. In this study, we attempted to deeply understand and interpret the participants' views and experiences about the errors in four operations, and aimed to reveal their awareness by looking at the answers given by the participants. The basic interpretive qualitative research design was used in this research to deeply understand and comment on the views of the class teachers on the errors that the students make in four operations, the sources of these errors and the solution offers to eliminate these errors.

2.2. Study Group

The criterion sampling technique, which is one of the purposeful sampling methods, was used to determine the study group. Since the subject of the study is the errors made by the students in the four operations, it was determined that the class teachers should have at least five years of seniority and one year training at each grade level. In order to identify the teachers who met these criteria, teachers were interviewed and the study group was established. 71 teachers were interviewed in the scope of the study in the district of Bağcılar in Istanbul. The study group consists of 48 class teachers who met the criteria and volunteered to participate in the study. 28 of the class teachers are female, 20 are male. 29 of the class teachers who constitute the study group have seniority of 5 to 9 years, 13 have 10 to 14 years and 6 have 15 years and over. 8 of these teachers are in the first grade, 11 in the second grade, 10 in the third grade and 19 in the fourth grade.

2.3. Data Collection Tools

The open-ended form prepared by the researchers and arranged in line with the views of the three field experts was used to reveal the errors of the primary school students in four operations and the solution offers of class teachers for these errors. There are six open-ended questions that participant class teachers are expected to answer in the form. Some of the questions in the form are as follows: 1) what are the errors that the students make in the addition operation? What kind of errors did you encounter? 2) What are the causes of the errors of the students? Why do they make these errors? 3) What did you do about the solution of these errors made by the students? What kind of solution offers did you find?

Necessary permission was taken before applying this form to class teachers. Schools that collaborated with researchers and participated voluntarily were preferred in the collection of data. The open-ended forms were applied by the second researcher to class teachers between 4 and 8 April 2016. It took the teachers 10-15 minutes to fill in the forms.

2.4. The Analysis of the Data

The data obtained were analyzed with descriptive analysis method. Descriptive analysis allows the obtained data to be explained and interpreted under pre-established themes and cause-effect associations to be established. In this analysis technique, data are presented according to the research questions [20]. In the analysis of the data obtained in the research, each form was coded as"*E1, E2 …"* and the answers given to each question were read separately by the researchers. Teachers' responses to forms are separated according to common descriptions. The categories were determined by coding these descriptions. Frequency table was given in the description and interpretation of class teachers' views on each theme.

The categories were determined separately by the researchers and consistency was ensured. Later, the researchers came together to resolve the disputes, and then they passed to the report writing process in accordance with the joint decision. The subjects which the researchers agreed and disagreed on were determined. In order to determine the credibility of the encoders, the formula of "Consensus / (Dissensus + Consensus) X 100" determined by Miles and Huberman [21] was used. As a result of this formula, the encoder reliability was found to be 84% and the encoder reliability was found to be consistent. Teachers' expressions are directly cited to ensure clarity.

3. Conclusions

This section includes findings related to four themes based on research questions. These themes are the errors students make in the addition operation, in the subtraction operation, in the multiplication operation, in the division operation, the causes of the errors in four operations and teachers' solution offers to eliminate these errors determined according to the opinions of the class teachers. The findings of each theme are presented with tables, and categories are included in the tables. In addition, descriptions of the categories in the tables are given under the table comments.

The responses to the question "What are the errors primary school students make in the addition operation according to the class teachers?" which is the first sub-problem of the research are given in Table 1.

Table 1. Teachers' views about the errors that primary school students make in the addition operation

Views	f
Carrying errors	*45*
Forgetting to add	40
Being unable to add the digits	3
Getting the wrong digits	1
Forgetting the digits	1
Place value errors	*15*
Cannot write the digits one under the other	12
Not knowing the exact value of the digit	1
Forgetting to add 2 digits both while adding the last digit	1
Confusing the digits while adding more than three numbers	1
Counting errors	*13*
Difficulty in rhythmical counting	12
Forgetting the numbers while doing addition by counting the fingers	1

According to Table 1, when the views of class teachers regarding the errors students make in the addition operation are taken into consideration, the most common four error sources in the addition operation are: "forgetting to add the digits (40)", "not being able to write the digits one under

another (12)", "difficulty in rhythmical counting (12)" and "not adding the digit to the result (3)". According to the opinions of the class teachers, the primary school students make the most errors in adding the digit, writing the digits one under another and rhythmical counting. When the errors related to the addition are divided into categories, there are three categories: carrying errors, place value errors and counting errors. Within these categories, it is seen that the most mistakes are carrying errors (45). Some examples regarding the views of class teachers regarding the errors students make in the addition operation are as follows:

E20: "They forget to add the digit while adding numbers with more than one digit."

E32: "When the students are adding more than two numbers, they cannot place the digits correctly one under another, therefore they get wrong sums."

E2: "They have trouble counting on top of number."

The responses to the question "What are the errors primary school students make in the subtraction operation according to the class teachers?" which is the second sub-problem of the research are given in Table 2.

Table 2. Teachers' views on the errors that primary school students make in the subtraction operation

Views	f
Decomposition errors	*50*
Being unable to subtract tens	20
Forgetting to subtract ten from the tens digit	17
When getting tens from the digits and tens are passed to the digits	6
Not being able to subtract from a number whose two or three digits are "0"	6
Unnecessary subtracting from tens	1
Operational errors	*19*
Subtracting the minuend from the subtrahend when the subtrahend is smaller	13
Subtracting the minuend from subtrahend	4
Forgetting to write the bigger number on top	1
Writing three numbers one under another and subtracting them	1
Counting errors	*5*
Backward rhythmical counting	5
Symbolic errors	*3*
Confusing the terms of subtraction	3

According to Table 2, when the views of class teachers regarding the errors students make in the subtraction operation are taken into consideration, the most common six error sources in the addition operation are: "being unable to subtract tens (20)", "forgetting to subtract ten from the tens digit (17)", "subtracting the minuend from the subtrahend when the subtrahend is smaller (13)", "when getting tens from the digits and tens are passed to the digits (6)", "not being able to subtract from a number whose two or three digits are "0" (6)", and "backward rhythmical counting (5)". According to the opinions of the class teachers, the primary school students make the most errors in being unable to subtract tens, forgetting to subtract ten from the tens digit, subtracting the minuend from the subtrahend when the subtrahend is smaller. When the errors related to subtraction are divided into categories, there are four categories, decomposition errors, operational errors, counting errors and symbolic errors. Within these categories, it is seen that the most mistakes are the decomposition errors (50). Some examples regarding the views of class teachers regarding the errors students make in the subtraction operation are as follows:

E44: "They make errors in operations with tens digits."

E36: "They may forget that the tens digit reduce after subtracting from the tens digit"

E6: "Subtracting the minuend from the subtrahend when the subtrahend is smaller"

The responses to the question "What are the errors primary school students make in the multiplication operation according to the class teachers?" which is the third sub-problem of the research are given in Table 3.

Table 3. Teachers' views on the errors that primary school students make in the multiplication operation

Views	f
Place value errors	*40*
Not scrolling digits in two-digit multiplication	29
Confusing the order of digits in multiplication	4
Leaving the tens digit in the second multiplier un-multiplied	3
Writing the products in the wrong digit	2
When multiplying a two digit number with another two digit number, multiplying the ones digit by the other ones digit and tens digit by the other tens digit	2
Operational errors	*36*
Forgetting the digits in multiplication	14
Being unable to count rhythmically	12
Failure to transfer the addition to multiplication	8
Errors in the addition in the sub-operations when finding the result of the multiplication	1
Being unable to multiply a two-digit number with another two-digit number	1
"0" errors	*2*
Errors in the multiplication by 0	1
Adding the 0 wrongly in the multiplication of a number ending with 0	1

According to Table 3, when the views of class teachers regarding the errors students make in the multiplication operation are taken into consideration, the most common five error sources in the multiplication operation are: "not scrolling digits in two-digit multiplication (29)", "forgetting the digits in multiplication (14)", "being unable to count rhythmically (12)", "failure to transfer the addition to multiplication (8)", and "confusing the order of digits in multiplication (4)". According to the opinions of the class teachers, the primary school students make the most errors in scrolling digits in two-digit multiplication, forgetting the digits in multiplication, and rhythmical counting. When the errors related to the multiplication are divided into categories, there are three categories: place value errors, operational

errors and "0" errors. Among these categories, it is seen that the most mistakes are place value errors (40). Some examples regarding the views of class teachers regarding the errors students make in the multiplication operation are as follows:

E7: "They forget to scroll a digit in the multiplication of the numbers with two digits."

E35: "They may forget the digits in the multiplication operation like they do in the addition operation."

E14: "They get wrong results since they cannot do rhythmical counting correctly."

Table 4. Teachers' views on the errors that primary school students make in the division operation

Views	f
"0" errors	*27*
Failure to add "0" to the quotient	26
The error made by deleting the zero in-between	1
Place value errors	*12*
Starting to subtract from the ones digit, not from the number on the left while dividing	3
Starting the dividend from the ones digit	2
Writing the multiplication in the ones digit	2
If the divisor is not in the digit, failure to merge with the other digit	2
Failure to write all the digits in order after the first subtraction	1
In the case of dividing a two or three digit dividend by a one-digit divisor, dividing all the digits of the dividend at once	1
When a division is not done in the first digit, they have trouble in the other digits	1
Operational errors	*10*
Writing the number exactly in the quotient without doing multiplication after finding how many divisors there are in the dividend	2
Leaving the operation at half	2
Error made when looking for divisor in the remainder	2
Error in sub-operations related to multiplication	2
Error made when looking for divisor in the dividend	1
The quotient is not multiplied and subtracted from the divisor	1
Counting errors	*2*
Failure to count rhythmically backward	2

The responses to the question "What are the errors primary school students make in the division operation according to the class teachers?" which is the fourth sub-problem of the research are given in Table 4.

According to Table 4, when the views of class teachers regarding the errors students make in the division operation are taken into consideration, the main errors in the division operation are: "failure to add "0" to the quotient (26)", "starting to subtract from the ones digit, not from the first number while dividing (3)", "writing the number exactly in the quotient without doing multiplication after finding how many divisors there are in the dividend (2)", "starting the dividend from the ones digit (2)", "if the divisor is not in the digit, failure to merge with the other digit (2)", "leaving the operation at half (2)", "error made when looking for diviser in the remainder (2)", "error in sub-operations related to multiplication (2)", "failure to count rhythmically backward (2)", "writing the multiplication in the ones digit (2). According to the opinions of the class teachers, the primary school students make the most errors in adding "0" to the quotient and starting to subtract from the leftmost digit. When the errors related to the division process are divided into categories, there are four categories of errors related to "0", place value errors, operational errors and counting errors. Among these categories, it is seen that the most mistakes related to "0"errors (27). Some examples regarding the views of class teachers regarding the errors students make in the division operation are as follows:

E45: "They forget to write 0 to the quotient when the divisor is not in the dividend."

E16: "Errors arising when they do the subtraction not from the leftmost digit but from the ones digit"

E19: "Errors in re-dividing the remainder."

The responses to the question "What are the errors primary school students make in the four operations according to the class teachers?" which is the fifth sub-problem of the research are given in Table 5.

Table 5. Teachers' views on the errors that primary school students make in four operations

Views	f
Student-originated	*86*
Doing the operations carelessly	30
Failure to fully understand addition, subtraction, multiplication and division operations	11
Not reviewing the subject	8
Not listening to the teacher	5
Not solving enough questions	5
Wishing to finish operations immediately	5
Not knowing the exact value of the digit	4
Having an underdeveloped mathematical intelligence	3
Not complying with teacher's warnings and directives	2
Incomplete and missing knowledge of multiplication table	2
Mislearnings	2
Not having enough information	2
Failure to comprehend what is read	2
Having an underdeveloped operation skill	1
Incomplete learning regarding the numbers	1
Not reviewing the subjects at home	1
Lack of comprehension of tens and ones	1
Not loving the Maths lesson	1
Teacher-originated	*19*
Failure to concrete operations while transferring them to students	8
Rote learning based education system	4
Insufficient training on rhythmical counting	3
Insufficient equipment in lessons	2
Failure to use suitable methods and techniques in lessons	2
Program-originated	*11*
Limited number of maths lessons	5
Inadequate activities in the class within the time given in the program	2
Failure to spare enough time to subjects due to amplitude of subjects	2
Program is not suitable with students' level	1
Limited number of activities in the program	1
Student's family and environment- originated	*6*
Apathy of the family towards education	4
Failure to transfer the knowledge into application	2

According to table 5, class teachers stated that the errors that students make in four operations originate from the following: "student (86)", "teacher (19)", "program (11)", "student's family and environment (6)". They stated the main reasons that originate from students as follows: "carelessness (30)", "failure to fully understand addition, subtraction, multiplication and division (11)", "not reviewing the subjects at home (8)". As for the main reasons that originate from teachers, they stated the following reasons: "failure to concrete operations (8)", "rote learning based education" and "insufficient training on rhythmical counting (3)". As the reasons arising from the program, we encounter "limited number of lessons (5)", "inadequate activities in the class within the time given in the program (2)", and "failure to spare enough time to subjects due to amplitude of subjects (2)". In addition, teachers stated that "apathy of students' families towards education (4)" is another factor leading to errors in four operations. According to the opinions of the class teachers, the errors that primary school students make in the four operations are caused by the student, the teacher, the program, the student's family and environment. The errors originating from the student are caused by carelessness, failure to fully understand four operations and students' not reviewing the subjects at home. The errors

originating from the teacher are caused by failure to concrete operations, rote learning based education and insufficient training on rhythmical counting. The errors originating from the program are caused by limited time and inadequate activities in the class within the time given in the program due to large classes. Apathy of families also play a role in the errors that students make. Some examples of class teachers' views regarding the errors students make in four operations are given below.

E7: "inattention, hurrying up, failure to comprehend the subject, not reviewing the subject, not solving enough questions."

E15: "Limited number of Maths lessons, not concreting the subjects starting from the first grade and insufficient number of problems solved".

E19: "Failure to spare enough time to subjects due to amplitude of subjects."

E31: "Large classes, inability to care for the student one-to-one, not doing revisions, rote learning based education system."

The responses to the question "What are the solution offers of class teachers to eliminate the errors primary school students make in four operations?" which is the sixth sub-problem of the research are given in Table 6.

Table 6. Teachers' solution offers regarding the errors that primary school students make in four operations

Views	f
Suggestions regarding the content of the courses	*95*
There should be more examples and revision	21
The course content should be concreted	12
The material should be bigger, understandable and sufficient	11
More time should be spared to rhythmical counting exercises	8
One-to-one exercises	7
Dramatization of the subjects	5
Using visual elements	5
Frequent revisions	5
Providing peer support within the class	3
More time should be spared to maths course	3
Progressive teaching method should be selected	2
Stories should be used	2
Students should be able to express with their own words	2
Covering the last digit while scrolling to the left in multiplication	1
Drawing sticks while dividing two-digit numbers	1
Solutions made by using problem statements becomes clearer	1
Learning by experience should be provided	1
Computer-Aided Instruction	1
Results should be compared and discussed	1
It is necessary to enhance the exercises for reading comprehension	1
Students should be able to get the logic of the operation	1
We need to teach four operations by making a comparison with each other	1
Recommendations for teachers	*14*
Examples should be given from daily life	2
Exercises to increase attention should be done	2
We need to make the lesson more interesting	2
We need to find and create different activities	2
We must destroy the perception "Maths is hard"	1
There should be more blank spaces in work sheets instead of more questions	1
We should get the students control the operations	1
We should warn the students not to hurry up	1
We should revise the ones and tens	1
We need to use attention-grabbing colour pencils	1
Recommendations for students	11
Student's belief that they can do must be supported	3
The student's active participation in the class must be provided	3
They need to do their homework complete	3
They should find the answers by means of mental pictures	2
Increase of the interest of the family and routing the family	*7*

According to table 6, class teachers stated solution offers regarding the errors that students make in four operations under for main headings: "the course content (95)", "teachers (14)", "students (11)", and "family (7)". Regarding the content of the courses, they stated "more examples and revisions (21)", "concreting (12)", "the material should be large and enough (11)" and "more time should be spared to rhythmic counting exercises (8)". As for teachers, they suggested "giving examples from daily life(8)", attention-enhancing exercises (2) ","making the lessons more interesting (2)" and "finding and creating different activities (2)". Regarding the students, they suggested "student's belief that they can do must be increased (3)", and "they must do their homework complete (3). In addition, teachers stated "the interest of families should be increased (7)" as a solution offer to eliminate the errors in four operations. To eliminate the errors primary students make in four operations, primary school teachers made suggestions regarding the course content, teachers, students and families. Teachers suggested that there should be more examples and revision in the lessons, subjects should be concreted and the material should be sufficient. Regarding the teachers, it has been suggested that examples should be given from daily life, attention-increasing studies should be done and lessons should be made more interesting. Regarding the students, it has been suggested that students' active participation in the class must be provided and students' belief that they can do should be increased. Some examples of the views of teachers regarding their solution offers to eliminate the errors made in four operations are given below.

E33: "Subjects should be concreted and more examples should be done."

E36: "I worked privately with the students with lack of attention. I tried to do exercises to attract their attention. I got their friends tell the crux of operations. "

E38: "I gave examples from life to find solutions to errors."

E43: "I used a variety of materials to embody the concepts of four operations."

E5: "In order to minimize mistakes, I first concreted the subjects and tried to make them grasp the logic. I gave them opportunity to do plenty of examples. I sometimes told them stories. I first used materials before continuing with operations. Problem statements allow them to do error-free operations. "

4. Discussion and Conclusions

This study aims to evaluate the errors students make in four operations in line with teachers' views.

According to the results of the research, when the views of class teachers regarding the errors students make in the addition operation are taken into consideration, the most common error in the addition operation is "forgetting to add the digit", in the subtraction operation, "failure to subtract two or more digit numbers". In his study, Doğan [22] found out that errors that were mostly seen resulted from digits in the addition operation while in the subtraction operation; errors were mostly seen in subtracting from two or more digit numbers. The results are similar in this respect. In his study, Kubanç [23] found out that 1st, 2nd and 3rd graders had more difficulty in questions that included addition operation than subtraction and errors and misconceptions were seen more in 2 or more digit numbers than 1 digit numbers. According to Haylock and Cockburn [24], errors in the addition operation usually occur when children are working with formal written methods involving an addition of numbers such as 26+37, especially when they try to transfer one digit to the other digit. According to Sadi [12] addition is easier than other four basic arithmetic operations. The two most common errors made in relation to addition are due to the lack of understanding of the digit value concept and placing the numbers vertically on the digits.

According to the results of the research; given the views of classroom teachers regarding the mistakes that students make in the multiplication operation, the five most common error sources are: "scrolling digits in the multiplication of two digit numbers", "forgetting to add digits", "failure to count rhythmically", failure to transfer addition to multiplication", and "confusing the order of digits in multiplication". When we look at the opinions of the class teachers about the errors made by the students in the division operation, the main errors in the division operation are "failure to add "0" to the quotient", "subtracting not from the first digit but from ones digit in the division", "writing the same number without multiplication after finding how many divisors the dividend has", "leaving the operation at half", "errors made while finding how many divisors remainder has", "error in sub-operations related to multiplication", "failure to count rhythmically backward" and "writing the multiplication under ones digit". In his study, Kubanç [23] discovered that students had more difficulty in division than the multiplication operation with respect to the success of the schools and the class levels. Considering the success of the schools, there was no significant difference in the 2nd graders in terms of the type of operation and that the 3rd graders in the most successful school had more difficulty in the multiplication process while the 3rd graders in the most unsuccessful school had more difficulties in the division operation. It has been seen that the errors and the misconceptions in the division operation are less than the addition, subtraction and multiplication operations. In his study, Doğan [22] discovered that the error rate in the multiplication process is higher, and the reason for this is that the operation is more complex than the other operations and that it includes many rules within itself. According to him, the most common mistakes in this operation result from failure to fully understand the logic of multiplication operation and forgetting to add digits or adding more than necessary digits. In the division operations, the errors are made mostly because the digit values of the numbers are not

used in the correct place. The error rate increases especially when the divisor is a two or more digit number. In addition, it has been seen that students make many errors while they try to find how many divisors a two or more digit dividend has. It is seen that the most errors are made in the multiplication operation, then the division, subtraction and addition operations. In their study called common arithmetic difficulties students experience in four operations, Varol and Kubanç [25] brought together studies that examine the difficulties students experience in four operations. The study which examines both domestic and foreign sources found that students often had difficulty with four operations in mathematics, mostly due to the lack of knowledge of digits and grouping concepts. Errors and misconceptions in two or more digit numbers are more common than errors and misconceptions in single-digit numbers. One of the biggest reasons of the difficulties that students experience in the four operations of mathematics results from the confusion of the rules of addition, subtraction, multiplication and division, or improper memorization of these rules. Tirosh, Tsamir and Hershkovitz [26] found that students are more successful in addition and multiplication operations than subtraction and division operations according to teachers' views. In their study, Cockburn and Litter [27] investigated the emergence of early mathematical misconceptions of students and their views regarding mathematics. According to their research results, multiplication and division operations with zero have confusing properties.

According to the results of the research class teachers indicated that the errors students make in four operations result from "the student", "the teacher", "the program" and "the student's family and environment". Main student-originated reasons are "carelessness", "failure to fully understand the concepts of addition, subtraction, multiplication and division" and "not reviewing at home". As for the main reasons that originate from teachers, they stated the following reasons: "failure to concrete operations", "rote learning based education" and "insufficient training on rhythmical counting". The errors originating from the program are caused by "limited time" and "inadequate activities in the class within the time given in the program due to large classes" "limited number of lessons" and "failure to spare sufficient time to subjects". In addition, teachers stated that "apathy of students' families towards education" is another factor leading to errors in four operations. Tatar and Dikici [28] conducted a literature research in their study called learning difficulties in mathematics education. Their study revealed that learning difficulties in mathematics generally resulted from four main sources: the inadequacy in mathematics teaching, the abstractness of the subjects (inability of students to think abstract), the inability to interpret verbal expressions and the inadequacy of the level of readiness of the students. According to Cockburn [15], most of the teachers stated that they cannot express how and why they do what they do while others stated that they know exactly how to provide effective learning environments and how to respond to unexpected situations.

According to Cotton [29], in research on teaching, teachers emphasize three forms of knowledge to make effective teaching possible. The first of these is knowledge of subject; the student must feel secure in terms of mathematical knowledge that he or she has in order to carry out effective teaching. Secondly, teachers should understand the program. In this way, mathematical ideas and concepts appropriate to the age groups to be taught should be determined. Thirdly, the teacher must choose appropriate strategies and activities to enhance mathematical thinking of the students.

According to the research results, class teachers suggested the solution offers regarding the errors students make in four operations under four main headings as "the content of the lesson", "teachers", "students", and "the family". Regarding the content of the lessons, they stated that "we should do more examples and revision", "we must concrete the subjects", "the material should be big and sufficient" and "more time should be spared to rhythmic counting exercises". Regarding teachers, they suggested that "examples should be given from daily life", "works to enhance attention should be done", "lessons should be made more interesting" and "different activities should be found and created". Regarding students, they suggested that "student's belief that they can do should be increased", "the active participation of the student in the lesson should be provided" and "they should do their homework complete". Furthermore, regarding the elimination of errors in four operations, teachers suggested that "the interest of families should be increased" and "there should be less subjects in the maths book". In their study, when Küçük and Demir [30], asked the teachers who work in the 6-8th grades in primary schools and who have completed their at least 10th years in the profession about the reasons why students experience difficulties in understanding and application in maths lessons, teachers' answers were rule-based teaching, students' apathy towards learning maths, large classes and the classes are not homogeneous, families are not interested in education, scientific mistakes in textbooks, ambiguities in textbooks, insufficient lecturing in textbooks and lack of sufficient details and examples.

In line with these results, it can be suggested to the teachers they do more addition operations with two or more digit numbers, more subtraction operations with two or more digit numbers, they give more importance to scrolling digits and rhythmical counting in multiplication operations, they spare more time to division operations that include adding "0" to the quotient and more importance should be given to start from the leftmost digit while doing subtraction in a division operation. In addition, it is suggested that teachers do more examples in the lessons, concrete the subjects, give examples of daily life, and make attention increasing activities. Regarding the mathematics program, it can be suggested to increase the number of activities and the duration of the courses. Aside from these, it may be suggested that the student's family and environment actively

take part in the education process. Researchers should conduct more researches regarding what needs to be done in order to determine the sources of mistakes and eliminate them.

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Elementary School Students Perception Levels of Problem Solving Skills

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Abstract The purpose of this study is to reveal the perception levels of problem solving skills of elementary school students. The sample of the study is formed by totally 264 elementary students attending to 5th, 6th, 7th and 8th grade in a big city in Turkey. Data were collected by means of 'Perception Scale for Problem Solving Skills' which consists of two sub-dimensions. As a result of the study, the perception level of problem solving skills of elementary school students was high and there was no difference according to their genders. Perception levels of problem solving skills of students show a significant difference according to their grade levels. This difference is due to the fact that 8th grade levels are lower scores than other grades. At the same time, there is a similar and significant relationship between students' perception scores for problem-solving skills and the sub-dimension 'Perceived willingness and commitment towards problem solving skills' scores.

Keywords Problem Solving Skills Perception, Mathematics Attitude, Elementary School Students

1. Introduction

Parallel to rapid technological and scientific developments in the world, the problems faced by people are multiplying and becoming complicated. It is necessary to seek and develop appropriate solutions to these problems. Problem solving is a tool for new ideas and abilities [1] a way to develop effective learning and individual skills [2]. Problem solving is one of the focus areas of 21st century learning [3]. It involves the composition and coordination of various abilities, beliefs, attitudes, perceptions, knowledge and prior achievements. For this reason, it has an important place in teaching mathematics. There are different problem-solving approaches depending on the problem solving, the characteristics of the activities, the nature of the problem and the person who is interested with the problem. The more traditional, rational approach is typically used and involves, e.g., clarifying description of the problem, analyzing causes, identifying alternatives, assessing each alternative, choosing one, implementing it, and evaluating whether the problem was solved or not [4].

Problem-solving skill is seen as an individual variable, and it is expressed that the individual is shaped based on his beliefs and anticipations about his problem-solving skills [5] and helps the individual to effectively adapt to the environment in which he/she live [6]. In addition to the social problems that individuals have to solve in their society, the problems most often encountered by students are related to mathematics lessons [7] and science lessons, particularly physics and chemistry [8]. Mathematics-related behaviors which are related to problem-solving skills perceptions, contained in programs ranging from pre-school education to higher education [9].

When the literature is examined, there are researches on problem solving perception in different education levels with different variables. Koç [10] analyzed perceptions of second-level elementary school students about problem solving skills and their help seeking during the learning process. She found a significant relationship between primary school students' perceptions of problem solving skills and their need for help. Sezen and Palic [11] carried out a study with the aim of revealing the levels of problem solving skills of high school students. As a result of the study, it was determined that female students perceive themselves more positively in terms of problem solving skill than male students. However, it was found that grade levels did not have a significant effect on students' perception of problem solving skills.

Problem solving skills perception usually associated with the affective area. In this study, the relationship between problem solving skill perception and mathematical success and interest towards mathematics was tried to be revealed.

The aim of this study was two-fold. The first aim was to determine the levels of perception of problem solving skills of elementary school students. The second aim was to compare the effects of perception of problem solving skills,

mathematical success and interest towards mathematics. The present study focused on the following research questions within this general purpose:

What are the perception levels of problem solving skills of elementary school students?

Is there a significant difference between elementary school students' perception levels of problem solving skills according to gender?

Is there a significant difference between problem-solving perception scores and interest towards mathematics?

Is there a significant difference between elementary school students' perception levels of problem solving skills according to grade levels?

Is there a significant difference between elementary school students' perception levels of problem solving skills according to mathematics success?

2. Materials and Methods

2.1. Participants

Sample of the study is formed by randomly selected 264 elementary students (139 female, 125 male) from a school in İstanbul-Turkey. Thirty-six of the 5th year students (50.0%) were female, 36 (50.0%) were male; 28 of the 6th grade students (38.4%) were female, 45 (61.6%) were male; 40 of the 7th grade students (55.6%) were female, 32 (44.4%) were male; 21 of the 8th grade students (44.4%) were girls and 26 (55.3%) were males.

2.2. Data Collection Tools and Data Analysis

As a means of collecting data in the study, "Perception Scale for Problem Solving Skills" developed by Ekici and Balım [12] was used to determine students' perceptions of problem solving skills. For this scale, a form consisting of 37 items was applied to 850 elementary school students. As a result of preliminary applications of the scale, 6 items which were included as scale control items were removed from the analysis. As a result of the factor analysis, 9 items were removed from the scale and analyzes were repeated. Confirmatory and descriptive factor analysis of the "Perceptions Scale for Problem Solving Skills" revealed that the scale had two factors and 22 items including 15 positive and 7 negative items prepared in 5-point Likert style. The variance values regarding the factors were determined to be 30.239% for the first factor and 9.976% for the second factor. The scale consists of two sub-dimensions, "Perception towards problem solving skills" (15 items) and "Perceived willingness and commitment towards problem solving skills" (7 items). The reliability coefficient of the scale was .88 and the reliability coefficient was .86 in this study. The statistics of the collected data for the sub-problems were made using SPSS 18.0.

The results of the Kolmogorov-Smirnov normality test were examined to determine whether the data were fit for normal distribution before switching to the analysis process. The results of the Kolmogorov-Smirnov normality test were found to be normal for all dependent groups and parametric tests were used in this context. In the analysis of the data; unrelated group t test and one way analysis of variance (ANOVA) were used depending on the variables. The analysis of the relationship between dependent variables was calculated by applying the Pearson Moments Multiplication Correlation Coefficient technique.

3. Findings and Comments

This section contains findings from the research. Table 1 shows the descriptive statistics of the perception levels of problem solving skills of elementary school students.

Table 1. Perception levels of problem solving skills

	N	Mean	S
1.Sub-dimension	264	60.53	8.99
2.Sub-dimension	264	25.22	6.28
Total Scale	264	85.00	12.5

Standard deviation and average was used to determine the perception levels of students problem solving skills. The average of the scale score was obtained with the division of "the difference between highest value and the lowest value into two" and addition of this value to lowest value (110-22=88, 88/2=44, 22+44=66). Standard deviation is added and subtracted to the average for the calculation of the intervals (66+12.5=78.5, 66-12.5=53.5). Thus, middle level is obtained. The difference between the standard deviation and the average is regarded as the low level (66-12.5= 53.5). The value that is the sum of the standard deviation and the average is regarded as the upper level (66+12.5= 78.5). So as a result these are used in order to decide the limits of levels; the average score of the scale is 66, ranging from 22 to 53.5 indicates the students with low levels, 53.5 to 78.5 indicates the students with medium levels and 78.5 to 110 indicates the high levels of perception of problem solving skills. The overall average score of the study group was 85, indicating that the level of problem-solving perception of elementary school students was high.

Table 2 shows Independent Group t Test results which were made to determine whether the students' perceptions of problem solving scores differ according to gender variable.

As a result of analysis; there was no significant difference between the gender of the sample and the first sub-dimension "Perception towards problem solving skills" (t=-.688, p>.05), second sub-dimension "Perceived willingness and commitment towards problem solving skills" (t= -1.110, p>.05) and scale total scores (t= -1.009, p>.05).

Independent Group t Test was conducted to determine if the students "Perception of Problem Solving Skills" scores differ according to the answers of the question "Do you like the mathematics lesson?". Table 3 shows the data analysis results in response to this question.

As a result of analysis; there is a statistically significant difference between first sub-dimension "Perception towards problem solving skills" (t=5.699, p<.01), second sub-dimension "Perceived willingness and commitment towards problem solving skills" (t =-5.882, p < .01) and scale total scores (t = 6.925, p<.01). The scores of students who likes mathematics and scale sum were found higher than those who did not like this course.

One way ANOVA was performed to determine whether the Perception of Problem Solving Skills scores was differ according to the grade levels.

Table 2. Perceptions of problem solving according to gender

	Gender	N	Mean	Std. Deviation	t	p
1. Sub- dimension	Female	139	60.93	8.41	-.688	.492
	Male	125	60.17	9.49		
2.Sub-dimension	Female	139	25.68	6.05	-1.110	.268
	Male	125	24.82	6.48		
Total scale	Female	139	86.61	13.27	-1.009	.314
	Male	125	84.99	12.80		

Table 3. Perceptions of problem solving according to liking mathematics

	Likes Mathematics	N	Mean	Std. Deviation	t	p
1. Sub-dimension	Yes	169	62.76	7.86	5.699	.000
	No	95	56.55	9.53		
2.Sub-dimension	Yes	169	26.83	5.89	5.882	.000
	No	95	22.36	5.96		
Total scale	Yes	169	89.60	11.42	6.925	.000
	No	95	78.92	13.03		

Table 4. One-way ANOVA results of sub dimensions

	Grade	N	Mean	Std. Deviation		Sum of squares	df	Mean square	F	p
1. Sub-dimension	5	72	63.04	8.45	Between groups	1056.616	3	352.205	4.530	.004
	6	73	59.34	9.01	Within groups	20215.077	260	77.750		
	7	72	61.27	8.31	Total	21271.693	263			
	8	47	57.40	9.75						
	Total	264	60.53	8.99						
2.Sub-dimension	5	72	25.63	6.25	Between groups	394.382	3	131.461	3.417	.018
	6	73	25.53	5.80	Within groups	10003.981	260	38.477		
	7	72	26.18	6.35	Total	10398.364	263			
	8	47	22.65	6.7						
	Total	264	25,22	6.28						
Scale Total	5	72	88.68	12.86	Between groups	2403.739	3	801.246	4.912	.002
	6	73	84.87	12.28	Within groups	42412.227	260	163.124		
	7	72	87.45	12.71	Total	44815.966	263			
	8	47	80.06	13.45						
	Total	264	85.76	13.05						

The difference between arithmetic mean according to grade levels as a result of one way variance analysis (ANOVA) was found to be statistically significant in "Perceived Dimension of Problem Solving Skills" [$F_{(3-260)=}$ 4.530, p<.05], Perceived Willingness and Commitment Towards Problem Solving Skills" [$F_{(3-260)=}$ 3.417, p<.05] and scale total [$F_{(3-260)=}$ 4.912, p<.05]. Post-hoc Scheffe test was used to determine which groups were significant differences after ANOVA. According to this; perceptions of 5th grade students towards Problem Solving Skills Scale averages were found to be higher than average scores of 8th grade students.

The average score of 7th grade students' perceived willingness and commitment towards problem solving skills is higher than the average score of 8th grade students. 5th and 7th grades the total scale scores are higher than the 8th grades.

Table 5 shows the results of Pearson Multiplication Moment correlation analysis for the relationship between student's Perception of Problem Solving Skills and mathematics success of students.

As can be seen from Table 5, there was a significant positive correlation between the perceptions of problem solving skills (r =.290; p<.01) the perceived willingness and commitment towards problem solving skills (r =.335; p<.01) and total scale (r =.361; p<.01).

Table 5. Results of Pearson correlations

	N	r	P
Mathematics success Perception towards problem solving skills	264	.290	.000
Mathematics success Perceived willingness and commitment towards problem solving skills	264	.335	.000
Mathematics success Scale total	264	.361	.000

4. Discussion and Conclusions

The students in the study group were found to have a high level of perception of problem solving skills. This result may suggest that the sample is successful in the problem-solving process. While Koç [10] found that elementary school students' problem-solving skills perceptions were satisfactory in her study consistent with the results of our study the problem solving scores of the research groups were higher than the average in the various studies related to problem solving [13,14,15,16]. In contrast to this research, many research findings show that problem solving skills and knowledge of elementary school students are not at the desired level [17, 18, 19, 20, 21, 22, 23, 24, 25].

It was concluded that the students' level of perception of problem solving does not differ according to their gender. Although Koç's [10] study showed differences in perception sub-dimensions of problem solving skills of students according to gender, there was no significant difference between general problem solving skill perceptions. The findings of many researches on problem solving support this result [26, 27, 28, 29, 30].

There is a significant difference between "Perceptions towards Problem Solving Skills", "Perceived willingness and commitment towards problem solving skills" dimensions and scale total scores according to their answers of the question "Do you like mathematics?". The scores of students who like mathematics and high scale sum were found to be higher than those who did not like this course. The fact that you like a lesson affects all the process; it can be said that students who likes mathematics are also successful in problem solving. In the survey conducted by Kumandaş and Kutlu [31] the level of mathematics liking is a predictor of the success of the course, and as the level of mathematics liking of the learners' increases, the degree to which they are successful is also one of the result.

The level of perception of problem solving skill by students varies according to their grade levels. 8th grade students' problem-solving perception scores are significantly lower than other classes. In Koç's [10] study with 6th, 7th, and 8th grade students, 6th grade students' perception level on problem solving skills was found higher than 7th and 8th grade students. Similarly, the achievements of İflazoğlu Saban and Güzel Yüce [14] are consistent with the results that the averages of 6th grade students are significantly higher than the average of 7th and 8th grade students in the confidence sub-dimension of problem solving skills. In our study, it was found that the highest average belongs to the 5th grades when the average of the perception scores among the classes is taken into consideration. This result can be considered to be due to the general concern created by the high school transition examination they have to enter in the 8th grades in our education system. In addition, the intensity of problem solving gains in the elementary school program may also have been influential. At the same time, there is a similar and significant relationship between students' perception scores for problem-solving skills and perceived willingness and commitment towards problem solving skills. Researches [11, 32], which show that problem-solving skills decrease as grade level increases, support the findings of the study.

There was a significant positive correlation between students' mathematics success and perception of problem solving skills, perceived willingness and commitment towards problem solving skills and scale total scores at a high level. This shows that students who are successful in mathematics can also be successful at solving problems at the same time. In Özsoy's [24] study titled "The Relationship Between Problem Solving Skills and Mathematical Success"; there is a positive relationship between comprehension, planning, plan implementation, and control scores in the problem solving skill test of students with a high level of mathematics achievement. There is a positive relationship between mathematics success and problem solving skills. The findings of Mason

[33], Mohd and Mahmood, [30], Kaytancı [34] and Tertemiz [35] also support this finding.

Today, problem solving is no longer just one of many currents that have emerged in mathematics education and are forgotten. On the contrary, besides the arithmetic skills required to succeed in school and later in real life, problem solving is regarded as an integral part of the teaching program taught by most teachers [36]. Based on this importance, the recommendation for research is as follows: The reasons for the students' perception level for problem solving should not be reduced as the class levels increase, and the activities for problem solving skills should be increased. Heppner and Krauskopf [37]assume that self-perceived problem-solving skill serves a central function in the way a person perceives and experiences different aspects of dealing with problematic situations. However, it is expected to be reversed, the increase at the grade level caused decrease at the perception of problem-solving skills in the current study. Noushad [38] in a similar way emphasized that children's perceptions of their academic abilities decline precipitously during school. In order to prevent this situation, qualitative or mixed studies can be arranged to investigate the causes of these increase more deeply. Depending on the results obtained from these studies, empirical studies can be carried out to improve the perception of problem solving skills.

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The Study of the 5-6 Year-old Children's Appreciation the Humour at Preschool Education

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Abstract The aim of this study is to determine how the 5-6 year-old preschool children evaluate the humour through pictural analysis of their drawings about humour. The study was conducted with 52 preschoolers aged 5-6 at independent preschools attached to the Ministry of National Education. The data were collected through drawing and interview techniques. The obtained data were analysed by using the content analysis technique. The drawings by the preschoolers were found to support the Absurd Theory, the incongruity and the stages of development in humour, Bariaud's and McGhee's theories about the preschoolers and their styles of expressing the humour.

Keywords Preschoolers' Drawings, Humour, Preschool Education

1. Introduction

There are various definitions of humour. İn the literature humour is defined as incongruity, fun laugh, joy, pleasure and good mood (8). Humorous is defined as everything which involves in all areas of life, a nonsense and absurd idea, and everything which contributes to a person's having a good time (29). An aspect of children's humour development is the way they explain pictorial humour. That is, pictorial humour takes place in the development of humour. Brown (3) stated that there are a limited number of studies bringing out the skills of children's appreciation and description of humour. Four categories helping to describe the given explanations when looked at a humorous picture were developed: Category 1 includes the situations in which humorous elements in the picture are described as comic without giving any explanations defining why they are comic. Children say explain only why they find it comic or not. Category 2 is similar to Category 1 but there is an explanation. In Category 3, children describe the Picture as comic but they do not explain what it is comic. Category is similar to Category 3 (3). Most of the studies done between 1970 and 1980 include the appreciation of humour with mental development and comprehension and they were carried out in the experimental situations in which humour was used as a smile and laughing material a sign and indicator by using graphic stimulants. Schultz (1972) used, in his/her study, pictural cards and caricatures to study the incompatibility and resolution in children's appreciation the humour (8). There are different theories of humour in literature. Especially at preschool, according to Bariaud (2) and McGhee (20, 21), four characteristics of pictorial humour are used to understand pictorial humour. These characteristics are classified as: a) transferring of characteristics or displacement of characteristics; b) deformity-exaggeration in size; c) abnormal behaviours or situations; and d) misfortune or misbehaviours. The Absurd and the Empowerment Theory by Loizu (12) explains the children's sense of humour. The Theory of the Absurd consists of three categories: 1) comic gestures/ attitudes/ voices/words; 2) inconvenient activities and 3) the use of inconvenient materials. McGhee (19), the pioneer of humour development, emphasizes the importance of *incongruity*. According to McGhee (19), incongruity underlies in every kind of humour. Incongruity, a situation which causes an unexpected situation instead of an expected coherent situation in a case by stunning, creates a tension on a person. When the person restructures this situation as humorous, the ach laughing happens, the tension decreases and the relaxation happens (27). McGhee separates the development of humour into five phases. The children at the first phase laugh at the figure at which they attach (6 month / 12/15 months). The first humour reaction of babies is seen as a result of the experience with their parents. For example, a 6-7 months-old baby can laugh at his/her mother who controls the feeder from which milk does not come by taking it in her mouth or at his/her father walking like a penguin (21). The children begin to use an abject instead of another object at the second phase (inconsistent behaviours) (12/15 months – 3,4,5 years old). For example, 18 months-old Sally's laughing when she uses a toy cube as if it was a telephone and then she hangs up (6, 21). The children laugh by naming people, objects or body parts in a different way at the third phase (the naming of event, people in an inconsistent way)

(2,3,4 years old). They find miscalling on purpose comic. For example, they can laugh by naming a cat as a dog, a hand as a foot or they become happy they show a cat as a dog, a hand as a foot, an eye as a nose. The child must notice that there is an incongruity between the real and what he/she did so that such a situation can be perceived as a humorous situation (6, 21).

McGhee (21) evaluates the fourth phase (conceptual incongruity) in different categories: 4a) playing with the sounds of the words: Children like playing with the sounds (not meanings) of the words at this stage. For example, they laugh by producing combinations like daddy, paddy, faddy or silly, dilly, willy, etc.; 4b) The combination of meaningless and real words: Children like combining words in an absurd way even though they know it is wrong. For example, they say "I want more potato/dirt/guitar juice, chair soup, apple shoes, butter hats, etc. (11, 21); 4c) the distortion of characteristics of objects, people or animals: Children, at this stage, like adding some characteristics which do not belong to people, animals or objects, removing the present characteristics, changing the size, color, shape of the known things. They laugh at the situations, objects, and people having exaggerated characteristics and the inconsistent and impossible behaviours. For example, a person has a dog head, a cat that doesn't have a tail, a person having a square head, big ears, a skating cow (21). 4d) Giving names related to the opposite sex: Children, at this stage, laugh at naming as opposite sex. For example, telling 'This is Mary' by showing Tommy or saying 'hello Bobby' to Susie (11, 21).

At the fifth stage (multiple senses and the beginning of humour like the adults') (6/7 years old and later), children can understand and find funny the jokes in which there are words having several meanings thanks to their knowledge about the doubleness of the words. Rhymes are funny for children at this stage (21).

According the psychoanalytic theory, desires and fears underlie in children's drawing works. Children can express these feelings symbolically or secretly, which shows that children's mood can be understood through their drawings and their drawings can be used for this purpose. Drawings provide an advantage to observe individuals give also the opportunity to evaluate cultural and social determinants having a role in choosing topic and figure (31). Drawing is an image of the most natural imaginations of emotional and intellectual life that a child expresses in a typical and simple way. This characteristic, which is a reflection of the child's inner world and general development, shares similarities with the emotional period that important artists (painters) experience. Some drawings, symbols and signs that children obtain through perception are extremely meaningful in terms of activity period and they can be seen as important factors reflecting their world in a plain, pure and direct way (1). Children can reflect their feelings through drawings and they can express their sentiments and opinions about events. Drawings by children are accepted as a mirror of their inner worlds. Many researches have been done on his subject (5).

When the related literature is examined there are limited studies that examine how humorous situations are seen by preschool children. The children were shown certain drawings and the ways by which the children appreciated the humorous situation were examined or they were asked to take photos of the situations they find comic (2, 12, 14). It is seen that the situations in which children appreciate humour by looking at the pictures they drawn themselves were not studied. Therefore, The aim of this study is to examine the drawings in which the preschoolers aged 5-6 express the situations at which they laugh and the situations they find funny picture analysis. In this regard, the following questions were tried to answer:

- In the children's drawings related to humour, which situations did they draw as a funny state?
- In the children's drawings related to humour, which people, objects or animals did they draw as a funny element?
- In the children's drawings related to humour, which behaviour, conduct and attitude did they draw as a funny situation?

2. Method

2.1. Study Group

To determine the study group, purposive sampling method, which is often used for qualitative research, was preferred. The participants in the study determined the purposeful sampling method. The purposeful sampling gives the opportunity of studying the situations giving abundant information in depth. The situation sampling, which is one of the purposeful sampling methods, is a sampling that provides speed and practicability for a study (35). For this reason, in this study, the convenience sample, which is one of the purposeful sampling methods, was used. A criterion to determine the children was designated from the convenience sampling. 5-6 year-old children were selected as a criterion. 5-6 year-old children are at the pre-schema period and they are eager to talk about their drawings and they are aware that they draw pictures representing their feelings and thoughts. Towards 6 years old, the proportions begin to become more realistic and the details increase. Transparent pictures, which are called as rontgen or transparent, show up. The use of colors is accidental. The details in human figures (like skirt, pants, etc.) begin to increase (31).The study group consists of 52 preschoolers (28 female, 24 male), of whom 25 preschoolers aged 5 and 27 aged 6 at Public independent preschools attached to the Ministry of National Education, in the centre of Bursa. The study was conducted with voluntary preschoolers who show normal development.

2.2. Data Collection Means

In this study based on qualitative research techniques, the

semi-structured interview and expressing through drawings were combined.

Semi-structured interview:

The researcher came in the class with the class teacher and introduced herself. She stated that she would do drawing activities with them at that day. Then she interviewed with the child alone in another classroom. Every child was asked what makes him/her laugh the most and who is the funniest person for him/her? The children were encouraged to answer.

2.3. Drawing Technique

Drawing is a nonverbal technique for the children and teenagers who can't express himself/herself. Drawing technique is a kind of technique opening a window to children's opinions and emotions and revealing the image in the child's mind (30). In addition, the usage of drawing technique is also important in multiple fields. For example, drawings are used to gather information about the child's communication, expressing himself/herself and feelings, his/her problem solving, the problematic children's feelings and memory development (15). The quality of drawings in the picture and the content of the drawing reveal the perception of the child about himself/herself, the people around himself/herself (28). In this study, the children were interviewed by asking them questions about people or situations that make them laugh the most in order to encourage the children to draw pictures and remember them of the events which make them laugh. They were asked which event makes him/her laugh; who or what/ which animal or object makes him/her laugh and when they laugh. After the meeting, he/she was asked to draw the picture of the person, object, animal or event that makes him/her laugh. After he/she had drawn, the researcher interviewed with them face-to-face and she asked them to express their drawings and she wrote what the child said.

2.4. Data Collection

Each child was introduced into another room by the researcher and he/she was given a sheet of A4 paper and pastels of every color so that they can draw a picture. While the children were drawing, the researcher kept notes and the figures drawn by the children were recorded.

2.5. Data Analysis

The data obtained from this study were analyzed according to the content analysis approach. The researcher composed the codes and themes directly, which were not determined before, from the obtained data in conformity with the content analysis utilizing the related literature. The notes kept during the interview with every child were organized and prepared for a general coding before the content analysis. Content analysis is a general term which contains several strategies to analyze a composition (23). Content analysis is formed at the stages of obtaining data through interview, observation and documents, coding of data, finding the themes, organizing the codes and themes, defining the findings and interpreting them (35). In the study, validity and reliability were obtained by applying triangulation technique. The researcher triangulation, which is done by more than one researcher in the same research at the stages of data collection and analyses within the context of triangulation techniques (16), was applied in the study. In this context, all the researchers worked together at the stage of data collection and two researchers coded separately. The analyses realized by these two researchers were looked over with a third researcher. The analyses were completed by discussing on the different and incompatible codes. However, the obtained data were examined if they were compatible with each other and then the reliability was obtained. The analyses and the decisions related to the types of significant made by the experts were coded separately and the reliability of the research was estimated by using the formula Reliability = Consensus/Consensus + Disagreement x 100 (17).

3. Findings

Table 1. In children's drawings, the humour signs in the situations they found funny (N: 52)

Drawn Items	Female	Male	Total
Family			
Mother	7	1	8
Father	2	5	7
Elder sister/brother	6	4	10
Sister/brother	–	1	1
Other people			
Friend	5	4	9
Teacher	–	1	1
Foreigner	2	1	3
Dwarf	–	2	2
Manimal			
Horse – Human	1	–	1
Sheep – Human	–	1	1
Fish – Human	–	1	1
Millipede Human	–	1	1
Donkey–Human	–	1	1
Animal			
Horse	1	1	2
Bear	–	1	1
Items belonging to nature			
Sun	1	1	2
Tree	–	2	2
Cloud	1	2	3
Flower	1	1	2
Star	1	–	1
Entertainment hero/story hero/ imaginary hero			
Clown	2	3	5
Acrobat	–	1	1
Objects			
Socks	–	1	1
Hat	1	–	1
Clown nose	1	–	1
TV	1	–	1
Cornet	1	–	1
Unicycle	–	1	1
Hairpin/Crown	1	–	1
Shoes	1	–	1
House	–	1	1
Car	–	2	2
Distorting mirror	–	1	1
Hat	1	–	1
Shirt	1	–	1
Photo	1	–	1
Balloon	1	–	1

*Since the child used more than one item, the general total is more than the total number of children.

Table 2. General categories of drawings by children in terms of humour

Category	Definition
Incongruity	Humorous gestures : People using humorous gestures Incongruous/strange behavours (animals/people): the drawings related to people or animals behaving in an incongruous way Objects, distorsion (corrupting/transfert) of the characteristics of people or animals: They laugh at the situations, objects or people having exaggerated characteristics or incongruous or impossible behaviours. For example, a person having a dog head, a cat that does not have a tail, a person with a square head, big ears, a skating cow… A cow wearing a hat or a man having dog ears can been example (2,21).
	Incongruous appearance: children find funny the pictures of people, animals or objects having incongruous coulour, size or shape. The naming of objects, events and people in an incongruous way: Children like naming the objects, people and events in a different way. They find funny to name inaccurately on purpose (21).
	Naming inaccurately: Children name an object or a person inaccurately and they find it funny at this stage (for example, telling ear instead of nose) (21)
	Misfortunes/clumsiness or misbehaviours: Children laugh at clumsinesses or misfortunes by people or animals and they find them funny. For example, the fact a cat spills milk while it is trying to reach it or that a fish ejects water while a man is looking at a fish… (2,21)

At the table 1, it was seen that the majority of the children preferred to draw, as person, *elder brother/sister* (f=10), *friend* (f=9) and *mother* (f=8) when they were asked to draw at which they laugh. However, the most preferred person to draw was *father* (f=7) after mother. They drew *clown* (f=5) as entertainment hero.

The drawings by the children related to humour were categorized below according to Bariaud (2), Loizou (12, 14) and McGhee (20, 21).

The obtained findings and categories as well as the interview with the children and their drawings were indicated below.

Incongruity: Humorous gestures: Gestures such as laughing, smiling, sticking out his/her tongue, and other facial expressions (for example, sticking out his/her tongue, tweaking cheeks, etc.) are humorous signs. Below are examples related to the children's humour category:

The researcher: What did you draw?

C 26: My mother and my elder sister.

The researcher: Why is this drawing funny according to you?

C 26: My mother and my sister are raising their eyes and they do imitation like a cross–eyed(Figure1)

Figure 1. Mother and sister

The researcher: What did you draw?

C 50: My elder brother.

The researcher: Why is this drawing funny according to you?

C 50: My brother is sticking out his tongue.

The researcher: What did you draw?

C 44: My elder brother.

The researcher: Why is this drawing funny according to you?

C 44: My brother is pulling his ears and sticking out his tongue.

The incongruous behaviours of animals:

The researcher: What did you draw?

C 30: A bear climbing the tree.

The researcher: Why is this drawing funny according to you?

C 30: The breech of the bear is seen while it is climbing the tree.

Transferring/giving the human characteristics to animals:

The researcher: What did you draw?

C 4: A horse.

The researcher: Why is this drawing funny according to you?

C 4: The horse is speaking like a man.

The researcher: What did you draw?

C 2: A Child having donkey ear and tail

The researcher: Why is this drawing funny according to you?

C 2: He looks like a donkey but his face is like a man's.

The researcher: So why is this drawing funny?

C 2: because he has two donkeys ear and tail (Figure 2)

The researcher: What did you draw?

C 30: A lamb and a sheep.

The researcher: Why is this drawing funny according to you?

C 30: Their faces look like a man's. They look like a man.

Figure 2. Child with donkey ear and tail

Incongruous behaviours of people: Children find the incongruous behaviours of people funny. Here are some examples: The fact that his/her mother wears socks on her hands, that his/her father wears his shirt inside out, that his/her father wears a clown nose, that his/her elder brother or sister cocks a snook, that his/her elder sister does imitation like a monkey, that his/her brother raises his/her hands and makes a strange noise, that his/her father plays the halay at home, different gestures of the teacher, a man mounting a horse backwards, a man doing acrobatics on a cycle, the fact that his/her mother's using shoes like a telephone, the fact that his/her elder sister sucks a nipple…

Some examples were given below:

The researcher: What did you draw?

C 56: My mother's shoes.

The researcher: Why is this drawing funny according to you?

C 56: While my mother plays house with me, she uses shoes like a telephone.

The researcher: What did you draw?

C 51: A man riding a horse.

The researcher: Why is this drawing funny according to you?

C 51: Because the man mounted a horse backwards and he, as if he went back

Incongruous appearance:

The researcher: What did you draw?

C 20: My father and my elder brother.

The researcher: Why is this drawing funny according to you?

C 20: My elder brother and father look small while they are coming.

The researcher: What did you draw?

C 17: My elder brother, myself, socks with child figures.

The researcher: Why is this drawing funny according to you?

C 17: Because my elder brother wears socks with child figures. (Figure 3)

Figure 3. Socks with child

The researcher: What did you draw?

C 22: Myself, my mother, my father, distorting mirror.

The researcher: Why is this drawing funny according to you?

C 22: Because we look different (funny) in front of the mirror.

The researcher: What did you draw?

C 52: I drew my mother and father's wedding photo.

The researcher: Why is this drawing funny according to you?

C 52: My father's wedding suit is comic.

The researcher: Why is it comic?

C 52: his hat is comic (A family from Azerbaijan) (Figure 4)

Figure 4. Mother and father's wedding photo

The researcher: What did you draw?

C 49: My friend wearing a hairclip like a crown, flower, star, cloud, sun.

The researcher: Why is this drawing funny according to

you?

C 49: Because my friend's crown is too big, moreover it bigger than her head (Figure 5)

Figure 5. Friend

The researcher: What did you draw?

C 35: A dwarf.

The researcher: Why is this drawing funny according to you?

C 35: The dwarfs walking on the road make me laugh a lot.

The researcher: Why is it funny?

C 35: They are adults but they look like a child.

The researcher: What did you draw?

C 20: A dwarf.

The researcher: Why is this drawing funny according to you?

C 20: The fact that the dwarf's dancing makes me laugh.

The naming of objects, events and people in an incongruous way and the naming inaccurately:

The researcher: What did you draw?

C 6: My friend and I are talking.

The researcher: Why is this drawing funny according to you?

C 6: He/she calls me inaccurately and I'm laughing at it a lot.

The researcher: What did you draw?

C 9: My mother.

The researcher: Why is this drawing funny according to you?

C 9: Because my mother sings

The researcher: Why is it funny?

C 9: She sings in a wrong way.

The researcher: What did you draw?

C 11: My mother.

The researcher: Why is this drawing funny according to you?

C 11: While she is talking to me, she calls me Çiçek, so I laugh at it a lot.

Misfortunes or misbehaviours: Another situation at which children laugh a lot is clumsinesses or misbehaviours that people or animals do. In the study, children stated, through drawings and verbally, that they find their elder brother's or friend's falling, the clown's dropping the balls funny. Here are some examples:

The researcher: What did you draw?

C 4: The clown is playing with the balls.

The researcher: Why is this drawing funny according to you?

C 4: The clown is dropping the balls on the floor. Isn't is funny? (Figure 6)

Figure 6. Clown

The researcher: What did you draw?

C 28: child (girl), ice cream cone, ice cream

The researcher: Why is this drawing funny according to you?

C 28: Dropped the ice cream from the cone (Figure 7)

Figure 7. İce cream

Table 3. Below are the numbers of drawings according to the categories of humour in the drawings of children.

Topics Number of drawings	
Humorous gestures	10
Incongruous behaviours	
Animal	1
People	16
Giving human characteristics to animals	5
Incongruous appearance: colour, shape, size	9
Naming of objects, events and people in an incongruous way/Naming inaccurately	4
Misfortunes or misbehaviours	7
TOTAL	52

4. Conclusions and Discussion

The results of this study were discussed under two headings: the concept of humour in the drawings by children in terms of drawing technique and the Absurd theory–incongruity.

Drawing technique and incongruity:

5–6 year old children are at the period of the developments stages. The preschematic period (4–7 years old) are the period at which children begin to use symbolic systems. At this stage, children use symbols reflecting certain characteristics about the real world and reflect the similar ones of the objects he/she saw and knew through materials belonging to drawing plane (9,22). Even though children use symbols belonging to the real world to draw humorous situations, asking them questions about their drawings are important in order to obtain the validity and reliability of the study. In this study, even though the interviews were before the drawing activities, they were asked questions by the researcher about their drawings after they completed them and their responses were recorded. Thus, the humorous situations drawn by the children became more explicative.

According the findings of the study, it was seen that the children preferred mostly *elder brother/sister* as person to draw in the situations they find funny. Then *friend, mother* and finally *father* were mostly preferred. They preferred *clown* as an entertainment person. In the drawings related to *elder brother/sister*, the situations about incongruity and clumsiness were reflected. In the drawings related to *friend*, the expressed humorous gestured were clumsiness, misfortune, naming of objects, events and people an incongruous or inaccurate way. *Mother* was expressed mostly by her using humorous gestures, naming of objects, events and people an incongruous or inaccurate way and incongruous gestures. *Father* was expressed mostly by incongruity, misfortune, humorous gestures and incongruous appearance. *Clown* was mostly expressed by misfortune, clumsiness, incongruous appearance categories.

It can be clearly seen, in the drawings by the children, that there are traces of humorous gestures and incongruous behaviours taking place in the categories of the Absurdity theory (12). İn the drawings by the children, there are sticking out his/her tongue, different facial gestures, sticking out his/her tongue by pulling his/her cheeks towards both sides.

As for incongruous gestures, they drew and expressed mostly, as humorous gestures, the incongruous gestures and behaviours of their family members (mother, father, elder brother/sister); for example, his/her elder sister's mimic of monkey, his/her father's playing halay at home).

When we talk about the distortion of the objects, people or animals, it can be seen that the children drew the transferring of human characteristics to animals (drawing human face on lamb or sheep, drawing a half human half fish picture, speaking of a horse, etc.); here, visual humorous is the transferring of a characteristic belonging to a category to another category. A cow wearing a hat or a man having dog ears is good example for this. Preschoolers find funny the transferring of human characteristics to animals in their drawings and expressing of humorous situation (2, 13, 21).

When we examine the drawings by the children according to the incongruous appearance category, it can be seen that dwarf, their images in front of distorting mirrors, the reduced appearance of his/her father and elder brother crossing the road, his/her friend's wearing an exaggerated hairpin reflect an humorous situation. Children also find the appearance of abnormal object or people (14). In the Loizou's study (14), the photos about humorous situation taken by the children were analyzed. In the photos taken by children, it was seen that they found funny the whiteness of his/her grandmother's hair, baby dolls with long legs. Another important situation that children find funny is the naming in incorrect way (for example, calling *collar* instead of *head*…). Children like naming objects, people and events in a different way. They laugh at naming people, objects and body parts in a different way. They fing comic to name incorrectly on purpose. For example, they laugh by telling *dog* instead of *cat*, *socks* instead of *shoes* (6, 21). In the study, it is seen, in the drawings by the children, that his/her mother's calling him/her by a false name, his/her mother's singing incorrectly, his/her friend's calling him/her by a false name are humorous situations.

Misfortunes or misbehaviours: Another situation at which children laugh is misfortune or misbehaviours people or animals make. For example, a cat's spilling milk while it tries to reach it, the ejecting of water by a fish at the man looking at it… (2,21). In the study, the fact the clown' dropping the balls, his/her friend's causing to fall him/her by holding his/her leg, etc. are called humorous situations by the children.

In the study, it was seen that the children drew pictures compatible with the humorous and incongruous development stages of the Absurdity theory (12) and the four characteristics of Bariaud (2) and McGhee's (20,21) preschooler's pictorial humour (transfer or displacement of characteristics, distortion or exaggeration of the size,

abnormal behaviours or situations, misfortunes or misbehaviours). Similarly, in the study by Loizou (14), it was seen that the photos taken by the children were compatible with the incongruity category. The expressions of humour by the children and their understanding the photos were examined from different points of view. In these studies, even though the researchers worked on the understanding the joke, the humorous pictures and the comedies a lot (18, 3,25 32; 13), researches on linguistic humour are little. In this study, the children were asked to draw the situations that they find funny. Drawing is one of the ways to express themselves cosily for children (26). It was difficult to find a satisfactory study on linguistic humour since children express humorous situations through drawing. It was understood the humorous situations only by asking them questions about their drawing through face–to–face interviews and it was seen that his/her mother's calling him/her by a false name, his/her mother's singing inaccurately, his/her friend's calling him/her by a false name were called humorous situations. At the third stage (naming the objects, people or events in an incongruous way – 2–3–4 years old), children like naming the objects, events or people in an incongruous way. They laugh by naming the objects, events or body parts in a different way). They find comic to nickname on purpose. For example, telling *dog* instead of *cat*, *socks* instead of *shoes*, etc. (6, 21). This category belongs to incongruity category.

When the literature was examined, it is seen that there are a few studies about pictural humour at preschool period. A similar study was carried out by Pitri (36) 578 children (between 4,5 – 12 year-old) participated in this study which was conducted to find out better the children's untutored graphical presentations as a form of visual development rather than a form of perceptive development. The children were asked to draw something comic and to explain them. The aim of the study is to determine the themes of children's humour art. It was found out that there were different categories and characters of humorous art among children and there were not differences in children's humorous images according to their genders. Similarly, Loizou asked six children (5-6 year-old) to take pictures of the things they find comic at home and at school by using a portable camera to study children's appreciation and perception skill of humorous situations in 2011. He analyzed the pictures taken by children in the context of the theory of the absurd and empowerment. He explained the humorous elements according to the absurd and empowerment theory. Pushe-Navarro (24), in his study, two experiments were done to examine pictorial humour as an unusual but legitimate way to approach the study of children's representational activity and the transition from implicit to explicit knowledge. In both experiments, the participants were 3-4 year-old children. In the experiment 1, he studied the understanding of two pictorial jokes using two conditions, choice and verbal production. In the experiment 2, he compared the results of the experiment 1 with the comprehension that children had two versions of three pictorial jokes presented in two different sessions. The results showed three levels of comprehension. Changes according to the level were analyzed. The data suggest a tendency to stay at the same level although a few children descended or ascended. These changes occur within a short period of time and provide support for a particular conceptualization of cognitive development. Implications for illustrated mechanisms of change and representational redescriptions in young children were discussed. Loizou, in his study in (13), he showed comic drawings including multiple inconsistency to 80 preschoolers and examined the responses and reactions about the drawings. Both male and female preschoolers could explain equally the inconsistencies and comic parts in the drawings. Guo, Zhang, Wang and Xeromeritou (8) examined, in their study conducted with Chinese and Greek children of 4,5 – 5,5 year-old, the relation between humour and cognitive development. The drawings including humorous elements were shown to the children and they were asked to determine and explain the inconsistencies in the pictures. It was seen that there was a significant and positive relationship with both Chinese and Greek children's describing humour and their cognitive development.

In this study, it was aimed at children's expressing humorous situation. It was seen that the study supports the Absurdity theory (12), the humorous development stages of the preschoolers, and Bariaud's (2) and McGhee's (20, 21) understanding of pictorial humour by preschoolers.

This study was conducted to understand children's perception of humour. In the following studies, it can be done studies on younger children and on how they make their friends, parents and elder brothers/sisters laugh. In order to increase data diversity in the studies on children, drawings by children, interviews with children and photos taken by children can be used.

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The Investigation of Human Values Perceived from the Use of Social Media of Secondary School Students[i]

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Abstract This research has been carried out to investigate the relation between social media usage of secondary school students and their perceived human values. The population of the research consisted of 1952 students, of which 48% were female and 52% were male, 7th and 8th grade students attending secondary schools in central Adıyaman in 2014-2015 academic years. Nine secondary schools were selected randomly. Data for the research were collected through "Human Values Scale" developed by Dilmaç [1], and "Social Media Usage Motivation and Satisfaction Scale" developed by Ök [2]. Data were analyzed with SPSS using independent samples t-test and one-way-ANOVA analyzes. The research showed that the longer social media usage led to the lower total points from "human values scale" in certain subscales and the higher points in others; and the gender was determined to be significant in favor of male students in social media usage and satisfaction. In the light of results some suggestions were made for researchers.

Keywords Social Media, Values, Values Education, Secondary School Students

1. Introduction

Communication that is the fundamental instrument for socialization from past to present is the process of transferring the intended meaning to the addressee through the symbols and signs agreed before mutually. The communication has nonverbal oral and written types. Practicing today's Technologies into communication has enhanced the communication process in a variety nonesuch to the previous, and the domain has become an attractive area of investment for the entrepreneurs. The previous existence reasons for the computers and tablets as the final target product have recently fallen behind being a communication tool. This environment the electronic instruments open for themselves in communication creates social media. Use of computers as one of the fundamental factors of the information age we live in and the internet that has developed at an unprecedented pace since 90s have continued to become widespread all around the world. This popularization has transformed the societies. The educational system that has to reflect the changes in all sub-systems creating the society to its body rapidly has been in a struggle for using the computer-and internet-based technologies commonly and efficiently [3]. Efficient use of technological tools and instruments included in the educational systems has revealed new approaches in teaching methods and strategies.

Social media is generally used for communication, friendship, socialization, and sharing. However, use of social media technologies in education has recently become a current issue. Including the social media websites into the educational processes is remarkable. Teachers can create a community with simple steps, and can establish communication sharing with their students. All these provide conveniences for the users. On the other hand, new values and understandings appear in constantly changing world. As expressed by Güngör [4], technology change affects our values, as well. When the speed of technological improvement is faster than the speed of social development, then human values are possible to be mentioned as being in danger. In this changing process, we have to manage the change without disturbing the network between our tangible and intangible values. If we can fulfill this, the process of reaching to human values as the main target of life will be easier, and we will place our life standards on a stronger base in the society we live in.

Task and responsibility of education related to acquiring moral and human values have changed out of families, and the responsibility of schools has increased. Families' invoking the educational function they have to the schools together with their general educational expectations has also increased the responsibilities of schools. It is clear that ignoring the position schools undertake will not provide a benefit in terms of values education. According to Çağlar [5], improving technology has given acceleration to education

during the process of knowledge creation and transfer. The relationship between the people weakened, and pushed into the background. This result has made the values education in educational institutions more important.

In reference to the fact that individuals acquire values in their adolescent period, it is observed in students in secondary education period that use of social media has gradually increased, and virtual friendship, telling lies more easily and dissatisfaction have all increased, as well, through the developing technology. Because easier irresponsible behaviors are possible to be observed and establishing friendships is easier because there is no face-to-face communication. Such behaviors can cause social problems in the years ahead. Therefore, basic human values perceived by the secondary education students through the use of social media were investigated in this research.

1.1. Problem and Sub-Problems

The main problem of the research was expressed as "Is there a significant difference between social media use and perceived human values of the secondary education schools in terms of some variables?" In reference to this aforementioned problem, four sub-problems were determined in the research: Is there a significant difference in attitudes of secondary education schools towards social media use motivations and perceived values in terms of their (1) gender, (2) frequency of using social networks, and (3) the time for daily internet use? In the fourth sub-problem of the research, "Is there a significant difference between social media use motivations and perceived human values of the secondary education students?" was tried to be determined.

1.2. Importance of the Research

When the general objectives of Turkish National Education, it can be noticed to be including the expression of "raising individuals who adopts, protects and develops national, moral, human, spiritual and cultural values of their nation, who have a personality and character balanced and healthy bodily, mentally, morally, spiritually and emotionally, and have a free and scientific power of thinking and broad worldview, who is respectful to human rights, who values personality and enterprises, who bear responsibility for their society, and who are constructive, creative and productive" [6]. With reference to these expressions, character education is noticed to be one of the fundamental objectives of our national education and including the required values. The schools should provide students to make accurate decisions, make correct preferences, and display moral behaviors adopted and accepted in their societies. These values are accepted as a piece of school life. The classroom is an environment where daily-basis positive values are strengthened, modeled and practiced, but unintended negative behaviors are also known to be acquired. In this sense, determining the values schools convey, provide to be experienced and transfer to the future generations are remarkable in this research. Determining these accurately is a reference for determining more efficient, more productive and more realistic teaching activities and objectives.

It is known that students postpone the tasks they should fulfill academically while spending time on web environments. The time spent on the internet affects the course success of the students, as well. In accordance with the findings revealed through investigating the social media use of the students, in the light of the findings of using social media situation among students, certain suggestions can be offered to the psychological counseling and guidance centers at school on approaches to the students experiencing problems. Furthermore, it is also aimed to help families on social network websites' affecting dimension of students' academic behaviors. The target aimed to be reached through the values education is raising honest individuals having targets, character, ethics and personality. Developing behavioral patterns in students such as acquiring the basis for the emotional trust, reasoning the events displaying intelligent attitudes towards conflicting situations, adaptation, and solving the problems with accurate examples should be targeted. It is not possible to reach these objectives without describing the issue. For that reason, describing the current status of values education benefiting from the descriptive method is remarkable in this research.

1.3. Literature Review

It is not possible to find definitions that are exactly the same with each other on social media. "The core element of the definitions of social media is the way that the internet and other new technologies are being used to move away from media that was essentially a one-to-many model, for example broadcast, towards a many-to-many model, such as Facebook" [7]. After 2005s, a change has been experienced in social network websites due to the improvements in Web 2.0 technologies, and their popularities have increased. Moreover, the time users spend on social networks with several members from different age groups has had a significant increase within the period from their beginning to now [8]. The dialogues and shares individuals have with each other on social networks create the social media, in general. Social media is one of the newest ideas providing opportunities as a new type of online media where the highest level of shares is offered.

According to Lerman [9] social media websites have four common properties:

1. The users can create contents on various media types, and make contributions to these contents.
2. The users can tag the contents.
3. The users can evaluate the content through either an active voting or passive using.
4. The users can create social media networks defining common areas of interest such as persons and friends with other users.

Through the social media, individuals have the opportunity of expressing themselves at a degree they have never had. By means of social media, individuals, if they requested, can reach to large masses, and share their ideas, interpretations, experiences and information with them. Through the social media, individualization appears on the one hand, and a new type of socialization is created, on the other. The users reestablish and develop the social relationships in virtual environments upon social networks they consider as trustful and are familiar from the real life [10].

Paul & Lee [11] and Engelberg & Sjöberg [12] found internet addiction to be higher among men and children from low income families, adolescents were inclined to use technology although they were not open to access the information from various sources, they frequently used the social media and online games for leisure. They also added internet literacy in publishing and technology increased the likelihood of internet addiction. Although using social media instruments well creates the expectation of academic success, technical literacy skill is not a good predictor for the academic success. The adolescents who can reach to information from different sources and have ideas on the source of information are academically more successful.

Shaw and Gant [13] found a positive correlation between internet use and depression, loneliness and stress. Social media use has been noticed to have a recovering effect upon loneliness, self-confidence and depression. Over-participating into online activities has the potential of social isolation. Mazalin and Moore [14] expressed that not completing the social anxiety and personality development was correlated with heavy internet use; and Valkenburg, Peter and Schouten [15] mentioned that the frequency for using the social network websites had an indirect effect upon self-respect and psychological mood of the students, and the number of friends in social networking websites and the feedbacks for the shares on profile affected self-respect of the adolescents.

All previous studies have revealed that the internet has both positive and negative effects upon human psychology. Whereas social media use has a negative effect upon loneliness, it has a positive effect upon the social support. Such studies have been carried out more for adults, and the number of studies carried out on children is limited. Ando, Takahira and Sakamoto [16] reported that social networking websites have rapidly become popular among children and adolescents, and provided opportunities for creating a broad surrounding, and controlling the privacy and sincerity. On the other hand, social networking websites have caused dangers such as cyber-bullying, loss of privacy and establishing undesirable relationships. Livingstone and Brake [17] discussed the necessity for technology and media literacy trainings considering the opportunities and risks of social media.

One of the social networks that provides an environment where individuals can spend time together on a virtual platform is Facebook.com. Apart from this, it has been found in some researches carried out with university students in our country that Facebook was the one that was mostly used among the social networks [18] [19] [20] and the frequency of using was high [21]. There are several reasons for Facebook to be preferred at a high level. These reasons are its providing a multimedia with a rich variety, easy sharing establishing link with other websites, the possibility for connecting with broad communities providing preferences such as group, activity and application, providing the opportunity of online and offline chat, having an infra-structure providing support for running various games on mobile phones, having visually and Turkish language support [22].

It was expressed in the researches carried out on benefiting from Facebook in education that Facebook accommodated itself to the university environments of students, develop the communication of students with the other students [23] students' revealing their own ideas, supporting the students on using their researching, questioning and problem-solving skills, providing the active participation of students, their asking questions to the people around them, use of this network's not requiring much pre-knowledge, its being open to peer education, its supporting learning through educative games and multimedia, and revising the process due to not deleting the shares [24].

Moreover, Tiryakioğlu and Erzurum [25] determined that Facebook was also used and adopted by the lecturers, and could provide significant benefits to both lecturers and students with increasing learning communities and increasing lecturer-student and student-student interaction as being supportive of traditional teaching and including more learning styles.

1.4. Values

Whereas Güngör [4] expressed the concept of value as "the belief on either something is desirable or undesirable;" Çağlar [5] expressed values as the cultural element that appeared as a standard in thoughts, attitudes and actions of individuals. Erdem [26] defined values as the tendency of preferring a situation to another. Başaran [27] defined the value as a quality and quantity determining the importance an object, process, idea and/or action carry in an organization, and used as an instrument for evaluating an object, process, idea and/or action. The private schools and institutions have recently spent energy and sources for the programs and attempts designed for encouraging values and behaviors of their students. Values education has created a part of curriculum in different educative conditions all around the world. The countries such as India, Australia and Singapore regard practicing values education through a well-defined curriculum and course program. The observations in Australia have the "potential of supporting the social developments of the students strengthening the relationships between students, and students and teachers and

transforming the learning environment and surrounding and harmony and inclusion of schools." In Turkey, because the young and children grows at an instant-pleasure, easiness, distrust and fear-based survival and existence age, the need felt towards values education has been discussed to be increasing. The socio-cultural changes such as transition from extended family to nuclear family, extreme competition, familial expectations, commercialization of education, negative effect of media, misuse of information technology, globalization, and consumerism are noticed to create a remarkable pressure leading to the devastation of values upon children, families and schools. The schools consider values education as a solution for coping with the difficulties of the present day finding new ways to educate students. Starting from here, the young and children should be only trained on academic information they are required to know, and they should also be trained on "Being a Human" and living together. While training the students on values, they are provided to think, reason, question investigate, be interested and behave appropriately. The values are developed through allowing the students to speak, discuss and looking for their own values, not through obliging them to memorize the words.

No education is independent from the values, and objectives of education include the objectives of values education. Therefore, values education should not be considered as a load or supplementary to a curriculum, and activity. In fact, it should not be perceived as a different task for the schools engaged in developing academic success and learning of students. Undoubtedly, values education is under the responsibility of both parents and public; however, the schools as organized institutions should take the main responsibility of developing values in students. These efforts should be regarded as investments made to construct the basis for lifelong learning, and to support social adherence, national unity and global integrity beside perfectness. The target to be fulfilled with values education is to raise moral, hardworking, honest individuals with a good personality. Therefore, affective dimension is always prominent during the educational process. Ignoring the affective dimension in education will cause a significant potential of people not to be used. The affective dimension including the elements such as feelings, preferences, pleasures, beliefs, expectations, attitudes, feeling of appreciation, ethics and moral is an irreplaceable dimension for both individual and social life [28].

Recent technological improvements have caused some changes in our worldview, and it is certain that our beliefs and views have significant effects upon technological improvements. When the speed of technological improvements is faster than social development, human values are possible to be mentioned as being in danger. Furthermore, what is important during the process of development is providing the relationship between our spiritual values and material values to be mutual. If we can fulfill this, the process of reaching to human values as the main objective of life will be easier, and we will build our life standards in the society to a more solid ground [4]. In order for providing students to benefit from any environments in moral and values education, it is necessary to offer them some opportunities. Through the methods applied at home and at school, behavior model thought and rich learning environments provided students will be led to dispose the expected behaviors. Effects of moral and values education are more in environments enhanced with the contributions of modern equipment.

2. Materials and Methods

2.1. Research Model

In this study, screening model was used for analyzing the human values perceived with social media use of the secondary education students. A researcher who carries out a study with screening model investigates the subject directly, and make interpretations integrating his/her observations with the information s/he finds and applying to relevant reference persons and the records kept before. In screening model, recording the events as they are and classification are the leading properties. However, interpretation and evaluation are obligations. Screening model serves for two purposes: recognizing the current conditions and solving the problem. In screening model, data is collected from a large area at a specific period; collected data should belong to common and several numbers of individuals, events and situations as convenient to statistical processes. There is no effort for affecting and changing the researched issue [29].

2.2. Population and Sample

The population of the research included secondary education students studying in Adıyaman provincial center (Turkey). For the sample, 9 different secondary education schools in Adıyaman provincial center were screened. For determining the research sample, stratified sampling method as one of the probability sampling methods was based, and 1952 students were included into the study. The probability sampling is selecting the units from the population with an equal possibility at every turn. Stratified sampling is used in situations when there are sub-stratum or sub-unit groups in a population determined with its borders [30].

In the study, 51.3% out of 1952 students creating the sample were male, and 48.7% were female. Numbers of female and male students were close to each other. In the research, 48.5% of the students studied at the 7^{th} grade, and 51.5% studied at the 8^{th} grade. Whereas 41.9% of the students did not use any social networks, 20% used social networks 1-2 days a week and 10.6% used every day. Nearly 48% of the students use the internet and social networks for less than 1 hour or 1-2 hours when they connect to the internet. Ten percent of the students spend 2 hours and more

on the internet.

Table 1. Distribution of the Sample According to the Independent Variables

		N	F (%)
Gender	Female	951	48.70
	Male	1001	51.30
Grade	7th grade	946	48.50
	8th grade	1006	51.50
Frequency of using social networks	1-2 days a month	205	10.50
	1-2 days a week	403	20.60
	3-4 days a week	224	11.50
	5-6 days a week	96	4.90
	Every day	207	10.60
	Nonusers	817	41.90
Daily internet usage time	Less than 1 hour	484	24.80
	1-2 hours	463	23.70
	2-5 hours	145	7.40
	More than 5 hours	43	2.20
	Nonusers	817	41.90
	Total	1952	

2.3. Data Collection Tools

Two scales were used in this research. The first one was "Human Values Scale" developed by Dilmaç [1] for the students at secondary education grade in order to determine the values perceived by the students. The items in the scale were on five-point Likert type. The sub-dimensions of the scale were specified as responsibility, friendship, respect, honesty, and tolerance. The increase/decrease in scores indicated individuals to have/did not have more human values. In this study, Cronbach Alpha internal consistency coefficient was calculated to be .924 when the scale was performed to 1952 students. The reliability coefficient KMO was found to be .946. Considering these results, the scale was found to be valid and reliable. The second scale was developed by Ök [2] for determining the social media use motivations and satisfactions of the students. The items included into the scale as answers to the questions of "I use social media because…" were 1) Entertaining and Spending Time and Spending Time (İt needs my need for Entertaining and Spending Time, etc.); 2) Maintaining a relationship (I can establish contact with my friends, etc.); 3) Spending time (It makes me spend time when I get bored, etc.); 4) Virtual community (I can find more interesting people rather than the ones in real life, etc.); 5) Narcissism (I want to be easily recognized/known among the people, etc.); 6) Media habit (Looking at the photograph albums has become a part of my life, etc.); 7) Being informed (It makes me have ideas on several issues, etc.); and 8) Personal status (For developing mu status/position in the world, etc.).

2.4. Data Analysis

The data obtained through performing the relevant data to the students in the sample group were evaluated in Statistics Packages for Social Sciences 20.0 program, and the data were evaluated according to independent samples t-test and one-way Anova analysis tests. Furthermore, Bonferroni and Kruskal-Wallis tests were performed for determining among which groups there were significant differences.

3. Findings and Interpretation

3.1. Findings and Interpretation Related to the First Sub-Problem

Results of the independent groups t-test performed for answering the question of "ıs there a significant difference between social media use motivations and perceived values of the secondary education students in terms of gender?" as the first sub-problem of the research were presented in Table 2.

When the data in Table 2 were analyzed, differences were noticed in terms of gender in averages of the answers of the secondary education students related to the social media use and values scale. According to the independent groups t-test results performed for determining whether these aforementioned differences were significant or not, significant differences were observed in nine out of ten sub-dimensions of the scale; female students had higher scores rather than the male students in values of responsibility ($\bar{X}$ male= 26.49, $\bar{X}$ female=27.55, t=-5.306, p<.05), friendship ($\bar{X}$male= 27.88, $\bar{X}$female=28.82, t=-4.508, p<.05), respect ($\bar{X}$male= 27.69, $\bar{X}$female=28.6, t=-4.478, p<.05), honesty ($\bar{X}$male=21.43, $\bar{X}$female=22.66, t=-8.166, p<.05), tolerance ($\bar{X}$male=22.45, $\bar{X}$female=23.62, t=-6.371, p<.05), and maintaining a relationship ($\bar{X}$ male=16.45, $\bar{X}$female=17.00, t=-2.682, p<.05).

According to this, it was understood that female students had more responsibility, respect, honesty, and tolerance values and regarded maintaining the relationships more rather than the male students. In terms of virtual community ($\bar{X}$male=10.94, $\bar{X}$female=10.15, t=3.870, p<.05), narcissism ($\bar{X}$ male=40.24, $\bar{X}$ female=36.88, t=4.806, p<.05), being informed and personal status ($\bar{X}$male=14.18, $\bar{X}$female=13.57, t=2.698, p<.05) dimensions, male students were determined to value more rather than the female students.

Table 2. Independent Groups t-test Results of the Attitudes towards Social Media in Terms of Gender

	Gender	N	$\bar{X}$	SS	t	p
Responsibility	Male	1001	26.49	4.58	-5.306	.00
	Female	951	27.55	4.22		
Friendship	Male	1001	27.88	4.71	-4.508	.00
	Female	951	28.82	4.5		
Respect	Male	1001	27.69	4.73	-4.478	.00
	Female	951	28.6	4.13		
Honesty	Male	1001	21.43	3.42	-8.166	.00
	Female	951	22.66	3.19		
Tolerance	Male	1001	22.45	4.05	-6.371	.00
	Female	951	23.62	4.05		
Entertaining and Spending Time	Male	668	35.29	7.69	-.876	.38
	Female	467	35.69	7.41		
Maintaining a relationship	Male	668	16.45	3.53	-2.682	.00
	Female	467	17.00	3.2		
Virtual community	Male	668	10.94	3.26	3.870	.00
	Female	467	10.15	3.49		
Narcissism	Male	668	40.24	11.5	4.806	.00
	Female	467	36.88	11.7		
Being informed and personal status	Male	668	14.18	3.83	2.698	.00
	Female	467	13.57	3.7		

Sd= 1950

When the studies carried out on these were reviewed, it was noticed that Tekin Akdemir [31] expressed there was no significant difference in terms of gender in attitudes towards Facebook, and Argın [32] expressed no significant difference in attitudes towards social media. However, in the study carried out by Eser [33] investigating the relationship between human value levels and environmental attitudes of the elementary education students, human value scores of the female students were noticed to be higher rather than the male students. Gülnar, Balcı and Çakır [34] stated that male experiments regarded narcissism and self-presentation factors more.

3.2. Findings and Interpretation Related to the Second Sub-Problem

Results of the one-way variance analysis test performed for answering the question of "Is there a significant difference between social media use motivations and perceived values of the secondary education students in terms of the frequency of using social networks?" as the second sub-problem of the research were presented in Table 3. As could be seen in Anova test Table, the differences were significant in score averages of the students in responsibility (Fresponsibility=3.716, p<.05) dimension, friendship (Ffriendship=5.689, p<.05) dimension, Entertaining and Spending Time and spending time (Fentertaining and Spending Time=52.689, p<.05) dimension, in maintaining a relationship (Fmaintaining relationship=34.973, p<.05) dimension, in virtual community (Fvirtual community12.397, p<.05) dimension, narcissism (Fnarcissism=13.218, p<.05) dimension, and in being informed and personal status (Fbeing informed and personal status=8.434, p<.05) dimension.

As a result of the Levene test, Bonferroni test was conducted with responsibility, friendship, narcissism, getting informed and personal status dimensions in order to find among which groups the significance emerged. According to the result of Bonferroni test, the conscious of responsibility was more in students who did not use social media rather than the ones who used 1-2 days a month ($\bar{X}$1-2 days a month=26.14, $\bar{X}$ no use=27.36). In terms of friendship dimension, the rate was higher in students who used social media every day rather than the ones who used 1-2 days a month, 1-2 days a week and who did not use ($\bar{X}$everyday= 29.78, $\bar{X}$no use= 28.03, $\bar{X}$1-2 days a month=27.76, $\bar{X}$1-2 days a week=28.40). According to the result of Bonferroni test, it was noticed that narcissist personality traits increased as the social media use increased in terms of narcissism dimension ($\bar{X}$ everyday= 42.24, $\bar{X}$ 5-6 days a week =40.64, $\bar{X}$1-2 days a month= 34.35, $\bar{X}$1-2 days a week =38.64). Narcissist traits were the highest in students who used social media every day. Moreover, in terms of the being informed and personal status dimension, as the social media use of the student increased, the scores of being informed and personal status increased, as well.

Results of the Kruskal-Wallis test performed for Entertaining and Spending Time and spending time, maintaining a relationship and virtual community sub-dimensions according to the result of Levene's test were presented in Table 4.

Table 3. ANOVA Test Results in terms of the Frequency of Using the Social Networks

		Sum of Squares	Df	Mean Square	F	p
Responsibility	Between Groups	363.548	5	72.710	3.716	.002
	Within Groups	38079.426	1946	19.568		
	Total	38442.975	1951			
Friendship	Between Groups	603.525	5	120.705	5.689	.000
	Within Groups	41285.560	1946	21.216		
	Total	41889.086	1951			
Respect	Between Groups	129.030	5	25.806	1.293	.264
	Within Groups	38849.072	1946	19.964		
	Total	38978.102	1951			
Honesty	Between Groups	92.569	5	18.514	1.636	.147
	Within Groups	22026.766	1946	11.319		
	Total	22119.336	1951			
Tolerance	Between Groups	97.951	5	19.590	1.172	.321
	Within Groups	32528.965	1946	16.716		
	Total	32626.916	1951			
Entertaining and Spending Time	Between Groups	10236.236	4	2559.059	52.689	.000
	Within Groups	54883.526	1130	48.569		
	Total	65119.762	1134			
Maintaining a relationship	Between Groups	1452.107	4	363.027	34.973	.000
	Within Groups	11729.514	1130	10.380		
	Total	13181.621	1134			
Virtual community	Between Groups	542.839	4	135.710	12.397	.000
	Within Groups	12369.906	1130	10.947		
	Total	12912.745	1134			
Narcissism	Between Groups	6957.325	4	1739.331	13.218	.000
	Within Groups	148699.401	1130	131.592		
	Total	155656.726	1134			
Being informed and personal status	Between Groups	471.225	4	117.806	8.434	.000
	Within Groups	15783.415	1130	13.968		
	Total	16254.640	1134			

According to the result of Kruskal-Wallis test, the differences between Entertaining and Spending Time and spending time were found to be significant (X^2=171.431, p<.05). In terms of this result, students preferred using social networks more and more frequent for Entertaining and Spending Time and spending time. In the dimension of maintaining a relationship (X^2=126.610, p<.05), as the use of social media increased, the rate increased, as well. In terms of virtual community dimension (X^2=50.284, p<.05), as the frequency of using increased, virtual community values increased, as well.

Table 4. Kruskal-Wallis Test Results Related to the Sub-Dimensions

	Frequency of using social networks	N	Average Sum	X^2	p
Entertaining and Spending Time and Spending Time	1-2 days a month	205	378.65	171.431	.000
	1-2 days a week	403	517.59		
	3-4 days a week	224	602.31		
	5-6 days a week	96	653.53		
	Every day	207	776.87		
Maintaining a relationship	1-2 days a month	205	385.80	126.610	.000
	1-2 days a week	403	537.46		
	3-4 days a week	224	607.55		
	5-6 days a week	96	659.26		
	Every day	207	722.77		
Virtual community	1-2 days a month	205	467.24	50.284	.000
	1-2 days a week	403	540.53		
	3-4 days a week	224	577.31		
	5-6 days a week	96	647.89		
	Every day	207	674.14		
	Total	1135			

When the studies carried on this were reviewed, it was concluded in the thesis of Tekin Akdemir [31] upon investigation the relationships between academic delay behaviors and academic success and Facebook attitudes of the elementary education students that there were significant differences between the time for internet use and Facebook attitudes. This result supported the results of this research. The factors in this research were similar to the factors revealed in the research titled as "Motivations of Facebook, YouTube, and Similar Web Sites Users" carried out by Gülnar, Balcı and Çakır [34], and the research titled as "What is the motivation for using Facebook?" carried out by Doğruer, Meneviş and Eyyam [35]. In these researches, as well, narcissism and self-presentation motivation were determined as the factors considered as important by the users.

3.3. Findings and Interpretation Related to the Third Sub-Problem

Results of the one-way variance analysis test performed for answering the question of "Is there a significant difference between social media use motivations and perceived values of the secondary education students in terms of the daily internet using time?" as the third sub-problem of the research were presented in Table 5. As could be seen in ANOVA test Table, the differences between the averages of the students in virtual community dimension ($F_{\text{virtual community}}$10.895, $p< .05$), narcissism dimension ($F_{\text{narcisisim}}$= 8,836, $p< .05$), and being informed and personal status dimension ($F_{\text{being informed and personal status}}$=8,242, $p<,05$) were found to be significant.

Table 5. ANOVA Test Results in Terms of Internet Using Time of the Students

		Sum of Squares	Df	Mean Square	F	p
Responsibility	Between Groups	525.505	4	131.376	6.746	.000
	Within Groups	37917.470	1947	19.475		
	Total	38442.975	1951			
Friendship	Between Groups	185.624	4	46.406	2.167	.070
	Within Groups	41703.461	1947	21.419		
	Total	41889.086	1951			
Respect	Between Groups	271.008	4	67.752	3.408	.009
	Within Groups	38707.093	1947	19.880		
	Total	38978.102	1951			
Honesty	Between Groups	64.902	4	16.226	1.432	.221
	Within Groups	22054.433	1947	11.327		
	Total	22119.336	1951			
Tolerance	Between Groups	44.562	4	11.141	.666	.616
	Within Groups	32582.354	1947	16.735		
	Total	32626.916	1951			
Entertaining and Spending Time	Between Groups	5841.718	3	1947.239	37.153	.000
	Within Groups	59278.044	1131	52.412		
	Total	65119.762	1134			
Maintaining a relationship	Between Groups	676.179	3	225.393	20.385	.000
	Within Groups	12505.442	1131	11.057		
	Total	13181.621	1134			
Virtual community	Between Groups	362.689	3	120.896	10.895	.000
	Within Groups	12550.057	1131	11.096		
	Total	12912.745	1134			
Narcissism	Between Groups	3564.590	3	1188.197	8.836	.000
	Within Groups	152092.136	1131	134.476		
	Total	155656.726	1134			
Being informed and personal status	Between Groups	347.755	3	115.918	8.242	.000
	Within Groups	15906.885	1131	14.064		
	Total	16254.640	1134			

As a result of the Levene test, Bonferroni test was conducted with responsibility, friendship, narcissism, getting informed and personal status dimensions in order to find among which groups the significance emerged. According to the result of Bonferroni test, the sense of responsibility was higher in students who did not use the social media rather than the ones who used 1-2 days a month. In narcissism dimension, as the social media use increased, narcissist personality traits in students was noticed to increase, as well. Narcissist traits were at the highest level in students who used social media every day. Moreover, the rate increased as the social media use increased in the dimension of being informed and personal status. Results of the Kruskal-Wallis test performed in sub-dimensions of Entertaining and Spending Time and spending time, maintaining a relationship and virtual dimension were presented in Table 6. Ünişen and Demirbağ [36] [37] found that the more time allotted to computer use for reasons other than doing homework the more socially disapproved behaviors the secondary school students disposed.

According to the result of Kruskal-Wallis test, the differences between the averages of Entertaining and Spending Time and spending time were significant (X^2=171.431, p<.05). Considering this result, it was possible to mention that the students preferred using social networks more and more frequently for Entertaining and Spending Time and spending time. In terms of maintaining a relationship dimension (X^2=126.610, p< .05), as the social media use increased, the rate increased, as well. In terms of virtual community dimension (X^2=50.284, p<.05), as the social media use increased, the rate increased, as well. Tekin Akdemir [31] (2013) mentioned that there were significant differences between internet use history and daily internet using time and the time spent daily on Facebook and Facebook attitude; and this result was coherent with the findings of this research.

Table 6. Kruskal-Wallis Test Results Related to the Sub-Dimensions

	Daily internet usage time	N	Average Sum	X^2	p
Responsibility	Less than 1 hour	484	996.25	21.024	.000
	1-2 hours	463	946.37		
	2-5 hours	145	897.17		
	More than 5 hours	43	668.40		
	Nonusers	817	1012.17		
	Total	1952			
Respect	Less than 1 hour	484	999.54	8.335	.080
	1-2 hours	463	970.44		
	2-5 hours	145	897.73		
	More than 5 hours	43	801.14		
	Nonusers	817	989.49		
	Total	1952			
Entertaining and Spending Time	Less than 1 hour	484	467.20	109.264	.000
	1-2 hours	463	600.48		
	2-5 hours	145	727.97		
	More than 5 hours	43	813.51		
	Nonusers	-			
	Total	1135			
Maintaining a relationship	Less than 1 hour	484	486.65	66.794	.000
	1-2 hours	463	600.52		
	2-5 hours	145	680.85		
	More than 5 hours	43	753.01		
	Nonusers	-			
	Total	1135			

3.4. Findings and Interpretation Related to the Fourth Sub-Problem

The correlation analysis result performed for answering the problem of "Is there a significant relationship between social media use motivations and perceived human values of the secondary education students?" as the fourth sub-problem of the research were presented in Table 7.

As could be seen in Table 7, positive significant relationship at 46.8% level was found between the scores as result of the correlation analysis performed for determining the relationship between friendship sub-dimension and responsibility ($r=0.468$; $p<.05$). According to this, as the friendship sub-dimension score increased, responsibility total score increased, as well. As result of the correlation analysis performed to determine the relationship between responsibility sub-dimension and honesty, a positive significant relationship at the level of 39.2% was found between the scores ($r=0.392$; $p<.05$). According to this, as the score of responsibility sub-dimension increased, total score of honesty increased, as well. At the end of the correlation analysis performed for determining the relationship between responsibility sub-dimension and respect, a positive significant relationship at the level of 57% was found between the scores ($r=0.570$; $p<.05$). According to this, as the rate of respect sub-dimension increased, responsibility total score increased, as well. As result of the correlation analysis performed for determining the relationship between friendship sub-dimension and respect, a positive significant relationship at the level of 52.9% was noticed between the scores ($r=0.529$; $p<.05$).

According to this, it was possible to mention that as the score of friendship sub-dimension increased, respect total score increased, as well. At the end of the correlation analysis performed for determining the relationship between Entertaining and Spending Time and spending time sub-dimension and maintaining a relationship, a positive significant relationship at the level of 71% was found between the scores ($r=0.710$; $p<.05$).

According to this, as the rate for the Entertaining and Spending Time and spending time sub-dimension increased, maintaining a relationship total score increased, as well. As result of the correlation analysis performed for determining the relationship between Entertaining and Spending Time and spending time sub-dimension and virtual community, a positive significant relationship at the level of 52.9% was found between the scores ($r=0.529$; $p<.05$). According to this, as the rate for the Entertaining and Spending Time and spending time sub-dimension increased, virtual community total score increased, as well.

Table 7. Correlation Analysis of the Relationship between Social Media Use Motivations and Perceived Values

		Responsibility	Friendship	Respect	Honesty	Tolerance	Entertaining and Spending Time	Maintaining a relationship	Virtual community	Narcissism	Being informed and personal status
Responsibility	r	1	.468**	.570**	.392**	.155**	.181**	.239**	.104**	.104**	.199**
	p		.000	.000	.000	.000	.000	.000	.000	.000	.000
	N		1952	1952	1952	1952	1135	1135	1135	1135	1135
Friendship	r		1	.529**	.292**	.158**	.291**	.310**	.176**	.182**	.222**
	p			.000	.000	.000	.000	.000	.000	.000	.000
Respect	r			1	.363**	.116**	.224**	.260**	.142**	.164**	.265**
	p				.000	.000	.000	.000	.000	.000	.000
Honesty	r				1	.211**	.103**	.161**	-.014	-.046	.093**
	p					.000	.001	.000	.645	.118	.002
Tolerance	r					1	.083**	.116**	-.049	-.141**	.029
	p						.005	.000	.102	.000	.324
Entertaining and Spending Time	r						1	.710**	.529**	.568**	.563**
	p							.000	.000	.000	.000
Maintaining a relationship	r							1	.466**	.433**	.429**
	p								.000	.000	.000
Virtual community	r								1	.652**	.495**
	p									.000	.000
Narcissism	r									1	.613**
	p										.000

**. Correlation is significant at the 0.01 level (2-tailed).

4. Conclusions

It was concluded in the research that there were differences in social media use motivations and perceived values of the secondary education students in terms of their genders. It was also concluded that female students had higher level of responsibility value rather than the male students. Female students regarded friendship, respect, honesty, and maintaining a relationship sub-dimensions more than the male students. In virtual community, narcissism, being informed and personal status sub-dimensions, male students were noticed to leaning more towards virtual communities. In terms of narcissism sub-dimension, narcissism traits of male students (individuals' worshipping themselves, in a colloquial manner, individuals loving themselves) were noticed to be higher. In being informed and personal status sub-dimension, male students were determined to be more open to personal status and being informed on social media.

It was concluded that there were significant differences in social media use habits of the secondary education students and their attitudes towards perceived values in terms of their frequency of using the social networks. The conscious of responsibility was more in students who did not use social media rather than the ones who used 1-2 days a month. In the dimension of friendship, the distribution was higher in students who used social media every day rather than the ones who used 1-2 days a month, 1-2 days a week and who did not use. In narcissism dimension, as the social media use increased, narcissist personality traits in students increased, as well. Narcissist traits were the highest in students who used social media every day. In dimension of being informed and personal status, the rate increased as the use of social media increased. The students preferred using social networks more and more frequent in order to entertain and spend time. In dimension of maintaining a relationship, the rate increased as the use of social media increased. In dimension of virtual community, the values increased, as well, as the frequency of using increased. Upon this, media literacy course content at schools could be updated, and included in curriculums of all grades. This research could also be carried out with secondary education and high school grades.

In another result of the research, it was concluded that there were significant differences in attitudes of the secondary education students towards social media use habits and perceived values in terms of daily internet using periods. The conscious of responsibility was more in students who did not use social media rather than the ones who used 1-2 days a month. In friendship sub-dimension, the distribution was higher in students who used social media every day rather than the ones who did not use, who used 1-2 days a month and 1-2 days a week. According to the result of the test, as the social media use increased in narcissism dimension, the narcissist personality traits were noticed to increase, as well. Narcissist traits were the highest in students who used social media every day. Moreover, in being informed and personal status sub-dimension, the rate increased as the social media use increased. The students preferred using social networks more and more frequent in order to entertain and spend time. In maintaining a relationship sub-dimension, the rate increased, as well, as the social media use increased. The values increased as the frequency of use increased in virtual community dimension.

Finally, when the correlation between human values and social media habits of the students were analyzed, a positive significant relationship between friendship sub-dimension and responsibility was found in scores. As the score of friendship sub-dimension increased, responsibility total score increased, as well. At the end of the correlation analysis performed for determining the relationship between responsibility sub-dimension and honesty, a positive significant relationship was noticed between the scores. As the score of responsibility sub-dimension increased, honesty total score increased. As result of the correlation analysis performed for determining the relationship between responsibility sub-dimension and respect, a positive significant relationship was noticed between the scores. As the score of responsibility sub-dimension increased, respect total score increased, as well. At the end of the correlation analysis performed for determining the relationship between friendship sub-dimension and respect, a positive significant relationship was noticed between the scores. As the score of friendship sub-dimension increased, respect total score increased. As result of the correlation analysis performed for determining the relationship between Entertaining and Spending Time and spending time sub-dimension and maintaining a relationship, a positive significant relationship was noticed between the scores. As the score of Entertaining and Spending Time and spending time sub-dimension increased, maintaining a relationship total score increased. At the end of the correlation analysis performed for determining the relationship between Entertaining and Spending Time and spending time sub-dimension and virtual community, a positive significant relationship was noticed between the scores.

5. Recommendations

Social media addiction, which is relatively late defined for Turkey is of crucial importance as it has high a young and student population and widely used social media networks, all supporting the suitable conditions for the addiction. In Turkey, the problem of "internet and social network addiction" has been considered to increase gradually. The parents have remarkable responsibilities in order for this not to appear. Before reaching to a level of disease, families can introduce restrictions of use for their children, and lean their children towards different habits and hobbies. Therefore, the importance emphasized on values education has increased. The studies fulfilled only at schools for providing students to

gain pre-determined values, and supporting of teachers, school managers and other employees is not adequate. Families should also support the studies on values education at schools, and be a role model for their children in consistent with this education. The students who participated into the research were noticed to take much time on Facebook. Within this framework, experts can organize various activities such as courses, seminars, etc. for efficient and productive use of social networking web sites.

In this study, social media use and using objectives of the students were investigated. Some precautions could be taken for overcoming this problem for the health of future generations carrying out such studies should with different target groups and different levels. For example, individuals could be provided to have knowledge on this through organizing seminars of experts in educational institutions at ant grades. In order for values education programs to have success, these could be provided to be maintained as a part of the curriculum at all grades of education starting from the pre-school teaching period. Visual and applied trainings apart from the courses should also be provided in order to increase the values students give on human values.

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Examination of Occupational Anxiety Levels and Academic Self-efficacy of Physical Education Teacher Candidates

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Abstract This study aims at determining the occupational anxiety level of pre-service physical education teachers according to variables, and revealing the correlation between occupational anxiety and academic self-efficacy. Study group consists of 586 pre-service teachers from 10 different universities in Turkey. Data is collected by *"Occupational Anxiety Scale for Pre-Service Teachers (OAS)"* and "*Academic Self-Efficacy Scale (ASES)*". T-test and One-Way ANOVA are used for data analysis, and Levene test is conducted for variance equality. Confidence interval is .95. For gender variables, the results reveal that women's occupational anxiety is significantly higher than men's in the dimensions of OAS "total occupational anxiety", "socio-economic anxiety" and "school management anxiety" ($p<.05$). According to grade levels, there is significant differentiation in the dimension of OAS "total occupational anxiety", "job-oriented anxiety", "socio-economic anxiety", "interaction with students' anxiety", "colleagues and students' parents anxiety" ($p<.05$). For variables of participation in socio-cultural and sportive activities and in "socio-economic" dimension, the participants, who never participate in any activities, have significantly higher level of occupational anxiety than those who regularly participate in activities ($p<.05$). There is also a negative correlation between OAS and ASES ($p<.01$).

Keywords Pre-service, Physical Education Teacher, Occupational Anxiety, Academic Self-efficacy

1. Introduction

1.1. Occupational Anxiety

In philosophical thought, the concept of "anxiety" means that an individual does not consider him/herself worthy of existing before God [1], yet in psychological sciences, anxiety means a dominant psychological state of worry, nervousness or unease about a fear or something bad to happen [2]. Anxiety is also defined as emotional state of uneasiness, uncertainty, fear, concern, distress and loss of control felt by a person facing a threatening situation [3] and as an uncertain fear with no object [4]. Having conflict between one's motives to meet the basic needs may lead to develop anxiety and frustration feelings [5]. In order to mitigate anxiety and cope with conflicts, a person can develop certain behaviors such as forgetting, distorting motives, accusing others, making up excuses, taking out on somebody, developing fantasy, identification, puerility and sublimation [4]. The severity of anxiety can vary from a slight mood of unease and discomfort to a severe level of panic, and occurs in any situation that threatens the integrity of the personality. If the strategies used by a person to cope with anxiety are not effective, anxiety can cause psychoneurosis disorders [1].

Fuller [6] identifies three groups of teaching profession anxiety: egocentric anxiety, job-oriented anxiety and student–oriented anxiety. Teacher candidates are in the center of egocentric anxiety, questioning whether teaching is an appropriate profession for them. While job-oriented anxiety represents the anxiety of a teacher candidate about whether s/he can successfully carry on the education period, student-oriented anxiety reflects the anxieties of a teacher candidate about whether s/he can successfully plan a lasting teaching activity that responds to the needs and expectations of his/her students [7-10]. The anxieties of novice physical education teachers are examined under the categories of teacher's self-concerns, students, classroom management, procedures and safety; and it is indicated that as a result of an increase in the number of students in the classroom of the novice teachers, they started to experience an uneasiness about having a difficulty in teaching-learning process, a concern about giving poor education, and they felt anxious about their occupational inability and personal development. The occupational anxieties of teacher candidates focus on

certain points within a certain period of time [9]. In particular, these anxieties peak up when it is time for the Public Personnel Selection Examination (KPSS), which is centrally organized by the government so that teacher candidates can be appointed to the profession [11, 12].

Additionally, the studies showed that teacher candidates had economic and social anxieties and concerns about effective communication, adaptation to school and school environment, being neglected, lacking support and getting along with school management [10, 13]. It was observed that the novice physical education teachers had more safety concerns related to possible fractures (arm, leg, finger and nose), bleedings, bruises and contusions in physical education classes; it was also reported that the candidates were concerned about how to follow a procedure, the lack of equipment and materials, weather conditions, students' locker room activities and theft [10]. The studies on the future of teaching profession revealed that teacher candidates expressed their concerns about the uncertain and unstable future of the profession due to unqualified teachers, appointment and employment, crowded classrooms, failure to succeed in profession, lack of school equipment, negligence towards physical education lessons, inadequate teaching hours, the lack of career opportunities and insufficient salary and benefits [12, 14]. Occupational anxiety is also one of the reasons why teachers leave their jobs. Gray and Taie reported in a longitudinal study (conducted between 2007-2012) that 17% of teachers quit within the first 5 years.

It was observed that the previous studies on the occupational anxieties of teacher candidates targeted form teachers as well as science, math, physical education and pedagogical formation teachers as well as teachers for the mentally handicapped; and these studies focused on the impact of independent variables such as gender, employment, class level, academic success, parental attitude, economic situation, type of high school and being a licensed athlete and on the dependent variables such as occupational anxiety, occupational attitudes, self-efficacy and academic self-efficacy [16-22].

Anxiety can also influence the academic performance of the learner. According to the Yerkes-Dodson Law, low and moderate level of anxiety can cause positive performance while high level of anxiety can be destructive. Therefore, severe anxiety can result in negative motivation and ultimate failure of a teacher candidate to perform his/her task. In this context, the level of anxiety can affect one's belief in his/her ability to succeed [23]. According to Spielberger (2016), individuals with lower level of anxiety are more successful than those with higher level of anxiety [2]. There is a considerably negative correlation between the perception of occupational self-efficacy and anxiety [9]. For this reason; low anxiety –thanks to its stimulant, protective and motivational features – stimulates the individual against the undesired situations and motivates them to stand up to possible failures [22].

1.2. Self-Efficacy and Academic Self-Efficacy

In the light of this information, it is possible to suggest that one of the factors elevating the anxiety level is how an individual perceives and believes in his/her self-efficacy. The reason why people are interested in the perception of self-efficacy in education process is due to its impact on motivation [23] as one's motivation and perception of self-efficacy has a strong influence on his/her success [24]. Self-efficacy is defined as the belief in the ability of a person to perform specific actions to achieve desired outcomes [24]; one's self judgment of his/her own capacity to successfully organize and implement the required activities for achieving a certain level of performance; one's self judgment and belief in how s/he can successfully overcome possible challenges in the future [25]. In other words, self-efficacy is the individuals' self-perception about their capability and capacity to cope with different situations and succeed in performing certain activities [26]. The judgments of self-efficacy are influenced by individuals' direct and indirect experiences, verbal persuasions such as encouragement, advice, and suggestions by other people and their psychological states [26].

Self-efficacy describes one's beliefs in his/her own capabilities to shape his/her life in order to work and exert effort [23]. Self-efficacy is also effective in increasing success. Individuals with low level of self-efficacy can easily fall into despair and give up whereas the ones with higher level of self-efficacy can achieve higher goals and increase their possibility to be successful [24]. Success and achievement increase the belief of efficacy yet failures show a reverse effect. Individuals with a high level of self-efficacy perception tend to improve their perceptions about their own abilities and consider the challenges they face related to the responsibilities to be achieved, thus they are more determined, more successful and less stressful [27]. On the other hand, individuals with low level of self-efficacy tend to complain about their efficacy whenever they experience any challenge [25].

One of the concepts of "self-efficacy" is academic self-efficacy. Academic self-efficacy is defined as one's self-competency and self-belief in his/her successful accomplishment of education goals and academic tasks assigned to him/her during an education period [27-33]. In an academic learning environment, students may differ in their beliefs about how skillful they are in acquiring new skills and knowledge, and managing materials. The initial belief of self-efficacy can change as a function of previous experiences and aptitudes. While students are working, their academic self-efficacy is affected by awards, teacher feedbacks and certain personal factors such as their goals and information processing [34]. When students have a perception of a good progression in learning, they work on their tasks and improve their skills; their motivation increases and they acquire a sense of self-sufficiency to have a better performance [27]. Students, lacking academic self-efficacy, exaggerate the potential challenges they face

and thus believe that they are inadequate to overcome [25, 35]. Students with academic self-efficacy show tendency to minimize the potential challenges they face while fulfilling their duty, put more effort to complete their tasks and carefully focus [23] so that they can have better stress management [29].

While giving training to pre-service teachers, it is desired that a PE teacher is competent in his/her profession and has a sense of self-sufficiency. PE teacher is also expected to successfully perform syllabus and lesson plan [36] since the quality and self-efficacy of a teacher [37] have an influence on his/her teaching program and success in teaching, thus it may lead to change student behaviors [38]. What is expected from the teachers is that they can achieve these skills successfully, which is closely related to the quality of pre-service training they have and their perception of occupational self-efficacy [39, 40].

The study conducted on the perception of academic self-efficacy revealed that the perception of academic self-efficacy did not vary by gender [41, 43], yet for university students it differed in favor of men [44]; the perception of academic self-efficacy significantly differed according to class level – the higher the class level was, the higher was the score of academic self-efficacy [45-47] – and there was a positive correlation between academic self-efficacy and success [41,47,48]. The study conducted with the university students in Romania by Catalina et. al [49] found out that there was a positive correlation between emotional intelligence and academic self-efficacy, and predicted that emotional intelligence affected the academic self-efficacy by 25.7% while academic self-efficacy affected the academic success by 47.4%. Other studies reported that the academic self-efficacy perceptions of teacher candidates significantly predicted test anxiety, tendency to academic fraud, the focus of academic control, academic success and academic motivation [42,44].

In consideration of these explanations, it is possible to keep the anxieties of teacher candidates under control and increase their academic self-efficacy through pre-service training. Therefore, the analysis of the occupational anxiety levels and academic self-efficacy perceptions of physical education teacher candidates can provide an opportunity to understand, explain, solve and improve their attitudes. Additionally, the outcome of this study can also contribute to improve teachers' training programs, intensify their efforts in education process, improve their skills to overcome challenges and increase their academic motivation and success.

The main objective of this study is to determine the occupational anxiety level and academic self-efficacy of the physical education teacher candidates, and to examine the correlation between these two variables. To this end, the main research questions are identified as below:

1. What is the occupational anxiety and academic self-efficacy level of the participants?
2. Are the occupational anxiety and academic self-efficacy levels of the participants varied by gender, class level, participation in social activities and the variables of the evaluation of subjective academic achievement?
3. Is there a correlation between the occupational anxiety levels and academic self-efficacy perceptions of the participants?

2. Materials and Methods

2.1. Model

This is a descriptive and cross-sectional study. The independent variables of the study are gender, class, participation in social activities and academic success. The dependent variables of the study are occupational anxiety and academic self-efficacy.

2.2. Study Group

The study group consists of total 586 teacher candidates who are 1st to 4th grade students of physical education departments of 10 different universities (Aksaray, Anadolu, Cumhuriyet, Çukurova, Fırat, İnönü, Kafkas, Kocaeli, Mersin and Pamukkale) in Turkey. 56.8% of the participants is male and 43.2% is female. The mean age of the participants is 21.40 and SD = 2.40. Demographic characteristics of the participants are given in Table 1.

Table 1. Demographic characteristics of the sample group

Variables	Groups	f	%
Gender	Male	333	56.8
	Female	253	43.2
University	Mersin	74	12.6
	Cumhuriyet	60	10.2
	Anadolu	37	6.3
	Kafkas	72	12.3
	Fırat	70	11.9
	Aksaray	72	12.3
	Kocaeli	58	9.9
	Cukurova	62	10.6
	Pamukkale	39	6.7
	Inönü	42	7.2
Grade level	1st	162	27.6
	2nd	146	24.9
	3rd	145	24.7
	4th	133	22.7
Participation in social activities	Yes	321	54.8
	Sometimes	210	35.8
	No	55	9.4
Evaluation of subjective academic achievement	Poor	33	5.6
	Middle	323	55.1
	Good	230	39.2

2.3. Data Collection Tools

Occupational Anxiety Scale for Pre-Service Teachers (OAS) was developed as a five point Likert scale by Cabi and Yalçınalp [13] with the participation of 1st-4th grade pre-service teachers in the faculty of education (n= 283). The content validity of the scale was confirmed by the experts' opinion. Construct validity was examined by factor structure and it consisted of 45 items and 8 sub-factors, namely job-oriented anxiety, socio-economic anxiety, interaction with student anxiety, colleagues and students' parents anxiety, individual self-development anxiety, occupational exam anxiety, adaptation anxiety and school management. These factors corresponded to 65.7% of the total variance. Cronbach alpha coefficients of eight factors in the scale ranged from .67 to .94. The study revealed that the factors corresponded to 62.5% of the total variance, and total Cronbach alpha value was .96. The mean scores of the scale were considered as "low", "middle" and "high" when the occupational anxiety level was between1 - 2.33; 2.34 - 3.67; and 3.68 - 5.00, respectively.

Academic Self-Efficacy Scale (ASES) was developed by Owen and Froman [50] to help students determine their self-confidence in activities such as taking notes, responding to questions, writing, adapting to class and using computers. The original scale consisted of three dimensions (social status, cognitive applications and technical skills) and had totally 33 items. The test re-test internal consistency reliability mean co-efficient of the five-point Likert scale was calculated as .85. The adaptation of the scale to Turkish context was done by Ekici [33] with the participation of 683 university students. Explanatory Factor Analysis (EFA) was applied for construct validity of the scale and it was stated that the scale consisted of three factors, corresponded to 45.8% of the total variance and overlapped with 33 items on the original scale. Cronbach alpha values in the reliability analysis for each dimension were found as .88 for "social status" dimension, .82 for "cognitive applications" dimension, and .90 for "technical skill" dimension. For this study, it was found that the total variance explained by the factors was 42.3% and Cronbach alpha value was .93.The mean scores of the scale were classified as "low", "middle" and "high" while the academic self-efficacy level was between 1 - 2.33; 2.34 - 3.67; and 3.68 - 5.00, respectively.

2.4. Process

The universities, where we collected data, were determined according to geographical regions. Permissions were obtained from the administrators of physical education teaching departments of 10 different universities. An application guideline, scale forms and return envelops with address information were sent to the departments that approved the permission. Guideline desires a voluntary participation. Totally 750 scale forms were delivered, however 607 were returned. Thus the rate of return is 81.1%. A normality test was conducted before the data analysis and 21 participants affecting the normal distribution were deleted from the dataset.

2.5. Analysis of Data

In the analysis of data, t test was used for independent groups, One Way Variance Analysis (ANOVA) for more than two groups, and Welch test of Robus tests for more than two groups with non-normal distribution. Tukey was used as Post Hoc test for normal distribution, and Tamhane's T2 test for the situations with non-normal distribution. Pearson Product-Moment Correlation technique was used to determine the relation between the variables. The confidence interval was .95.

3. Results

Table 2 shows that the participants have the highest level of anxiety at "Occupational exam anxiety" sub-scale and the lowest level of anxiety at "Job-oriented anxiety" sub-scale. In Academic Self-Efficacy Scale, the participants have the highest level of efficacy at "Cognitive Applications" sub-scale and the lowest level of efficacy at "Technical Skills" sub-scale.

Table 2. Mean, standard deviation, kurtosis and skewness scores of the Vocational Anxiety and Academic Self-Efficacy Scale scores

Scales and Subscales	N	Min	Max	Mean	SD	Skewness	Kurtosis
Vocational Anxiety Scale (total)	586	1.00	4.18	1.90	.60	.83	.34
Job oriented anxiety	586	1.00	3.93	1.62	.63	1.24	1.07
Socio-economic anxiety	586	1.00	5.00	2.42	.93	.33	-.50
Interaction with student anxiety	586	1.00	4.67	1.68	.71	1.20	1.07
Colleagues and students' parents anxiety	586	1.00	4.80	1.62	.68	1.37	1.82
Individual self-development anxiety	586	1.00	5.00	1.75	.88	1.31	1.09
Occupational exam anxiety	586	1.00	5.00	2.72	1.11	.26	-.69
Adaptation anxiety	586	1.00	5.00	1.92	.87	.90	.35
School management anxiety	586	1.00	5.00	2.21	.89	.51	-.31
Academic Self-Efficacy Scale (Total)	586	1.21	5.00	3.45	.63	-.14	.09
Social status	586	1.20	5.00	3.37	.68	-.08	-.04
Cognitive applications	586	1.21	5.00	3.51	.67	-.20	-.03
Technical skills	586	1.25	5.00	3.32	.83	-.01	-.53

The results of Levene test in Table 3 show that the variances are equal in the total and sub-scales of Occupational Anxiety Scale and Academic Self-Efficacy Scale. There is a significant difference in the total scores of Occupational Anxiety Scale by gender *[$t_{(584)} = 2.021$, $p = .044$]*. The comparison between the groups shows that females' anxiety levels in "economic/social" and "occupational exam anxiety" sub-scales are significantly higher than males' anxiety level in total scores of Occupational Anxiety Scale *($p<.05$)*. There is also a significant difference in total scores of Academic Self-Efficacy Scale in terms of gender *[$F(584) = 2.233$; $p = .026$]*. It also reveals that females have significantly higher scores in Academic Self-Efficacy Scale and "cognitive application efficacy" sub-dimensions than males *($p<.05$)*.

Table 3. Mean, standard deviation, and t test results of Vocational Anxiety and Academic Self-Efficacy Scale scores according to gender

Scale and Subscales	Gender	N	Mean	SD	df	t	p
Vocational Anxiety Scale (Total)	Male	333	1.85	.60	584	-2.021*	.044
	Female	253	1.95	.58			
Job oriented anxiety	Male	333	1.61	.63	584	-.834	.405
	Female	253	1.65	.64			
Socio-economic anxiety	Male	333	2.33	.91	584	-2.623*	.009
	Female	253	2.53	.96			
Interaction with students anxiety	Male	333	1.64	.71	584	-1.581	.114
	Female	253	1.74	.72			
Colleagues and students' parents anxiety	Male	333	1.59	.70	584	-1.038	.299
	Female	253	1.65	.65			
Individual self-development anxiety	Male	333	1.74	.90	584	-.207	.836
	Female	253	1.75	.85			
Occupational exam anxiety	Male	333	2.54	1.05	584	-4.502*	.000
	Female	253	2.95	1.15			
Adaptation anxiety	Male	333	1.87	.88	584	-1.721	.086
	Female	253	1.99	.86			
School management anxiety	Male	333	2.22	.92	584	.276	.783
	Female	253	2.20	.86			
	Female	253	1.95	.58			
Academic Self-Efficacy Scale (Total)	Male	333	3.39	.63	584	-2.233*	.026
	Female	253	3.51	.63			
Social status	Male	333	3.35	.67	584	-.723	.470
	Female	253	3.39	.70			
Cognitive applications	Male	333	3.44	.66	584	-3.106*	.002
	Female	253	3.61	.66			
Technical skills	Male	333	3.30	.79	584	-.733	.464
	Female	253	3.35	.87			

(*) $p<.05$

Table 4. ANOVA Results of Vocational Anxiety and Academic Self-Efficacy Scale scores according to grade level

Scales and Subscales	Grade	N	Mean	SD	df	F	p	Post-Hoc
Vocational Anxiety Scale (Total)	1st	162	1.84	.55	3 582	3.15*	.025	2>1, 4
	2nd	146	2.02	.61				
	3rd	145	1.90	.65				
	4th	133	1.83	.55				
Job oriented anxiety	1st	162	1.53	.58	3 582	3.29*	.020	2>1
	2nd	146	1.75	.66				
	3rd	145	1.64	.69				
	4th	133	1.58	.59				
Socio-economic anxiety	1st	162	2.51	.90	3 582	4.80*	.003	1>4 2>4
	2nd	146	2.57	.91				
	3rd	145	2.37	.99				
	4th	133	2.18	.89				
Interaction with students anxiety	1st	162	1.58	.59	3 316.04	3.20*	.024	2>1
	2nd	146	1.83	.81				
	3rd	145	1.68	.75				
	4th	133	1.65	.68				
Colleagues and students' parents anxiety	1st	162	1.46	.55	3 314.84	6.18*	.000	2>1,4
	2nd	146	1.73	.73				
	3rd	145	1.72	.76				
	4th	133	1.58	.65				
Individual self-development anxiety	1st	162	1.74	.89	3 582	1.30	.272	-
	2nd	146	1.86	.87				
	3rd	145	1.72	.92				
	4th	133	1.66	.84				
Occupational exam anxiety	1st	162	2.59	1.10	3 582	1.47	.221	-
	2nd	146	2.77	1.12				
	3rd	145	2.68	1.14				
	4th	133	2.85	1.08				
Adaptation anxiety	1st	162	1.91	.87	3 582	.84	.473	-
	2nd	146	2.01	.85				
	3rd	145	1.90	.89				
	4th	133	1.85	.88				
School management anxiety	1st	162	2.17	.84	3 582	1.38	.248	-
	2nd	146	2.34	.94				
	3rd	145	2.18	.91				
	4th	133	2.15	.88				
Academic Self-Efficacy Scale (Total)	1st	162	3.42	.59	3 582	1.23	.300	-
	2nd	146	3.40	.59				
	3rd	145	3.44	.69				
	4th	133	3.53	.66				
Social status	1st	162	3.35	.64	3 582	.55	.646	-
	2nd	146	3.34	.64				
	3rd	145	3.36	.71				
	4th	133	3.43	.73				
Cognitive applications	1st	162	3.50	.61	3 582	.76	.516	-
	2nd	146	3.47	.62				
	3rd	145	3.50	.74				
	4th	133	3.59	.70				
Technical skills	1st	162	3.19	.81	3 582	5.59*	.001	4>1, 2
	2nd	146	3.21	.79				
	3rd	145	3.39	.84				
	4th	133	3.53	.82				

(*) $p<.05$

According to the results of Levene's Test in Table 4, there is no homogenous variances in Vocational Anxiety Scale in sub-scales "Interaction with students anxiety" *(p=.003)* and "colleagues and students' parents anxiety" *(p=.001)*. In terms of class varieties, the score differences between groups in the total scores of Occupational Anxiety Scale are significant *[F (3,582) = 3.145, p= .025]*. According to Tukey test results, the occupational anxiety scores of the second graders are higher than the scores of the first and fourth graders *(p<.05)*. In "job-oriented anxiety" sub-scale of Occupational Anxiety Scale, the occupational anxiety scores of the second graders are significantly higher than the anxiety scores of the first graders; and in "economic/social anxiety" sub-scale, the scores of the second and first graders are significantly higher than the scores of the fourth graders. According to Welch test results; in "interaction with students anxiety" sub-scale, the anxiety scores of the second graders are significantly higher than the scores of the first graders; and in "colleagues and students' parents anxiety" sub-scale, the anxiety scores of the second graders are higher than the scores of the first and fourth graders *(p<.05)*. There is no significant difference between the groups in the total scores of Academic Self-Efficacy Scale *[F (3,582) = 1.225, p= .300]*. However, the academic self-efficacy scores of the fourth graders are significantly higher than the scores of the first and second graders in "Technical skills" sub-scale of Academic Self-Efficacy Scale (p<.05).

Table 5. ANOVA results of Vocational Anxiety and Academic Self-Efficacy Scale scores according to participation in social activities

Scales and Subscales	Activity	N	Mean	SD	df	F	p	Post-Hoc
Vocational Anxiety Scale (Total)	Yes	321	1.87	.58	2 583	2.06	.128	-
	Smt.	210	1.90	.60				
	No	55	2.05	.66				
Job oriented anxiety	Yes	321	1.61	.64	2 583	1.74	.176	-
	Smt.	210	1.61	.62				
	No	55	1.78	.67				
Socio-economic anxiety	Yes	321	2.35	.90	2 583	3.08*	.047	No>Yes
	Smt.	210	2.44	.94				
	No	55	2.69	1.04				
Interaction with student anxiety	Yes	321	1.68	.74	2 583	.53	.591	-
	Smt.	210	1.66	.67				
	No	55	1.77	.73				
Colleagues and students' parents anxiety	Yes	321	1.59	.65	2 583	1.22	.295	-
	Smt.	210	1.63	.69				
	No	55	1.75	.79				
Individual self-development anxiety	Yes	321	1.73	.87	2 583	.18	.834	-
	Smt.	210	1.76	.90				
	No	55	1.79	.89				
Occupational exam anxiety	Yes	321	2.67	1.10	2 583	2.36	.096	-
	Smt.	210	2.71	1.10				
	No	55	3.02	1.20				
Adaptation anxiety	Yes	321	1.90	.83	2 141.43	Welch 1.06	.351	-
	Smt.	210	1.90	.89				
	No	55	2.12	1.06				
School management anxiety	Yes	321	2.16	.89	2 583	1.25	.287	-
	Smt.	210	2.29	.91				
	No	55	2.18	.84				
Academic Self-Efficacy Scale (Total)	Yes	321	3.50	.64	2 583	2.84	.059	-
	Smt.	210	3.40	.60				
	No	55	3.31	.65				
Social status	Yes	321	3.48	.67	2 583	9.23*	.000	Yes>Smt, No
	Smt.	210	3.25	.66				
	No	55	3.20	.71				
Cognitive applications	Yes	321	3.53	.68	2 583	.63	.535	-
	Smt.	210	3.51	.64				
	No	55	3.42	.69				
Technical skills	Yes	321	3.41	.83	2 583	4.91*	.008	Yes>No
	Smt.	210	3.25	.81				
	No	55	3.09	.81				

(*) p<.05

According to the results of Levene's test in Table 5, the variances are not homogenous in "Adaptation anxiety" sub-scale *(p= 0.009)*. The total scores of Vocational Anxiety Scale show no significant difference among the groups in terms of the participation in social, cultural, art and sportive activities *[F (2, 583) = 2.06; p= .128]*. However, the results of Tukey test show that in "economic/social anxiety" sub-scale of Occupational Anxiety Scale, the anxiety levels of those who do not participate in social activities are significantly higher than those who participate in social activities *(p<.05)*. There is no significant difference between the groups in the total scores of Academic Self-Efficacy Scale *[F (2, 583) = 2.84; p= .059]*. However, according to "social status" sub-scale of Academic Self-Efficacy Scale, the academic self-efficacy of those who participate in social activities are significantly higher than those who never or sometimes participate in the activities; and in "technical skills" sub-scale, those who participate in social activities have significantly higher level of academic self-efficacy than those who do not participate *(p<.05)*.

Table 6. ANOVA results according to subjective academic achievement variable of Vocational Anxiety and Academic Self-Efficacy Scale Scores

Scales and Subscales	Academic achievement	N	Mean	SD	df	F	p	Post-Hoc
Vocational Anxiety Scale (Total)	Poor	33	2.20	.67	2 583	5.17*	.006	Poor>Mid. & Good
	Middle	323	1.90	.59				
	Good	230	1.84	.59				
Job oriented anxiety	Poor	33	1.95	.73	2 583	5.15*	.006	Poor>Mid. & Good
	Middle	323	1.62	.61				
	Good	230	1.58	.64				
Socio-economic anxiety	Poor	33	2.65	1.01	2 583	1.21	.298	-
	Middle	323	2.42	.90				
	Good	230	2.38	.97				
Interaction with students anxiety	Poor	33	2.11	.90	2 583	6.79*	.001	Poor>Mid.& Good
	Middle	323	1.68	.69				
	Good	230	1.62	.70				
Colleagues and students' parents anxiety	Poor	33	1.89	.71	2 583	2.91	.055	-
	Middle	323	1.61	.68				
	Good	230	1.59	.67				
Individual self-development anxiety	Poor	33	2.14	.86	2 583	5.28*	.005	Poor>Good
	Middle	323	1.78	.90				
	Good	230	1.64	.84				
Occupational exam anxiety	Poor	33	3.03	1.23	2 583	3.63*	.027	Poor>Good
	Middle	323	2.78	1.06				
	Good	230	2.58	1.14				
Adaptation anxiety	Poor	33	2.20	1.13	2 583	2.01	.134	-
	Middle	323	1.88	.84				
	Good	230	1.93	.87				
School management anxiety	Poor	33	2.21	.93	2 583	.21	.808	-
	Middle	323	2.23	.88				
	Good	230	2.18	.91				
Academic Self-Efficacy Scale (Total)	Poor	33	3.16	.53	2 583	13.70*	.000	Good>Mid. & Poor
	Middle	323	3.36	.60				
	Good	230	3.60	.65				
Social status	Poor	33	3.16	.63	2 583	6.67*	.001	Good>Mid. & Poor
	Middle	323	3.31	.66				
	Good	230	3.49	.70				
Cognitive applications	Poor	33	3.18	.54	2 583	15.95*	.000	Good>Mid. & Poor
	Middle	323	3.42	.64				
	Good	230	3.69	.68				
Technical skills	Poor	33	3.08	.83	2 583	7.31*	.001	Good>Mid. & Poor
	Middle	323	3.24	.80				
	Good	230	3.48	.84				

(*) p<.05

According to the results of Levene's test in Table 6, the variances are homogenous. The results of the variance analysis show that the score differences between groups in the total scores of Occupational Anxiety Scale are statistically significant *[F (2, 583) = 5.168; p= .006]*. According to Tukey test results, the occupational anxiety level of those who consider their academic success as "poor" *(M= 2.20; SD= .67)* are significantly higher than those who consider their academic success as "middle" and "good" *(p<.05)*. The difference between the groups for the total scores of Academic Self-Efficacy scores are also significant *[F (2, 583)= 13.666; p= .000]*. According to Tukey's test results, those who consider their academic success as "good" have higher scores than those who consider their academic success as "middle" or "poor" *(p<.05)*.

Table 7 represents the results of correlation analysis for total and sub-scale scores of Occupational Anxiety Scale and Academic Self-Efficacy Scale. The results reveal a negative and statistically significant correlation between the total scores of Occupational Anxiety Scale and Academic Self-Efficacy Scale *(r =-.33; p<.01)*. Similarly, there is a negative and significant correlation between the sub-scales of both scales. In other words; as the occupational anxiety level of the candidates increases, their perception of academic self-efficacy significantly decreases.

4. Discussion

This study was conducted to determine the levels of occupational anxiety and academic self-efficacy of physical education teacher candidates and to examine them in terms of gender, class level, participation in sports and social activities and subjective perception of academic achievement. According to the results of the analysis conducted for the first research question *"Research question 1. What is the occupational anxiety and academic self-efficacy level of the participants?",* it is indicated that the highest level of occupational anxiety experienced by the participants is for "occupational exam anxiety" *(Table 2)*. Physical education teachers, as well as branch teacher candidates in other fields, have a similar appointment-oriented anxiety. For instance, Çelikten et.al. [51] found similar results in their study conducted on pre-service teachers. The study, conducted by Taşğın [8] on the occupational anxiety levels of physical education teacher candidates, revealed that they were worried only before they were appointed and they had concerns about whether they would be successful in the profession. Another study conducted to determine the occupational anxiety levels of form teachers found that form teacher candidates had low level of occupational anxiety [41]. It is possible that physical education teacher candidates have occupational exam anxiety only because it is not certain whether they will be successful at KPSS (Public Servant Selection Test). However, as a result of the training and education that the participants received in the universities, their occupational attitudes, self-efficacy perceptions, academic motivations and academic-self efficacy perceptions might have an impact on their academic achievements and the high level of appointment-oriented anxiety. The previous studies showed a negative correlation between self-efficacy belief and occupational anxiety [16, 20], and a positive correlation between self-efficacy and occupational attitudes [16]. On the other hand; a study conducted with pre-service teachers of education faculty indicated that according to employment variances, the anxiety levels of those who were pessimistic were significantly higher than those who were optimistic [21].

Table 7. The results of correlation analysis for total and sub-scales of Occupational Anxiety Scale (OAS) and the Academic Self-Efficacy Scale (ASES)

Variables	ASES (Total)	Social status	Cognitive applications	Technical skills
Vocational Anxiety Scale (Total)	-.334**	-.260**	-.341**	-.269**
Job oriented	-.337**	-.254**	-.353**	-.250**
Socio-economic	-.190**	-.147**	-.178**	-.214**
Interaction with students	-.275**	-.221**	-.281**	-.205**
Colleagues and students' parents	-.295**	-.226**	-.309**	-.209**
Individual self-development	-.276**	-.239**	-.273**	-.201**
Occupational exam	-.178**	-.133**	-.187**	-.133**
Adaptation	-.166**	-.135**	-.161**	-.151**
School management	-.201**	-.145**	-.209**	-.165**
** Correlation is significant at the .01 level (2-tailed).				

The analysis of participants' academic self-efficacy perceptions concludes that PE teacher candidates have the lowest score for "technical skills" sub-scale (Table 2). Another study conducted with pre-service teachers of education faculty showed that there was no significant difference between the groups according to the comparison between the academic self-efficacy perception level of PE teacher candidates and other field candidates (Social Sciences, Physics, Maths and Foreign Language) [52]. According to Bloom's Mastery Learning Model [53], a teacher candidate is expected to have cognitive, emotional and practical knowledge and skills. The result of this study state that PE teacher candidates consider themselves efficient in "cognitive" field yet inefficient in "technical skills/practices". The reason for having a low score in "technical skills" sub-scale can be explained through the fact that technical practices – theoretical knowledge – can't be transferred enough to practical knowledge in the education process. Another study conducted with form teacher candidates revealed certain findings that technology played an important role in the future of teaching profession and teachers should have been trained to have advanced technical skills [14].

"Research question 2. Are the occupational anxiety and academic self-efficacy levels of the participants varied by gender, class level, participation in social activities and the variables of the evaluation of subjective academic achievement?"

The comparison between occupational anxiety levels of the participants by *gender* variance shows that the scores of female candidates are significantly higher than the scores of male candidates in the total scores and "economic/social anxiety" and "appointment-oriented anxiety" sub-scales of Occupational Anxiety Scale (Table 3). The studies conducted with pre-service and in-service teachers [22] also indicated that occupational anxiety levels of female participants were higher than male participants, while some other studies found that gender variances were ineffective [19-21,42]. The fact that female participants have higher levels of appointment and they have economic/social anxieties can be interpreted as the results of the social, cultural and economic environments where they live. Similarly, Akgün et.al [22] suggested that women's higher level of occupational anxiety could have been affected by social values, socio-economic and cultural characteristics of their families, gender inequality and the development level of the region.

Gender-oriented comparison of academic self-efficacy perceptions of the participants reveals that the academic self-efficacy scores of the male and female participants differ, and that females' scores in the total and "cognitive applications" sub-scale of Academic Self-Efficacy Scale are significantly higher than the score of male participants (Table 3). On the other hand; the study conducted by Tabancalı and Kazım [52] with the students from different departments of education faculty, the study conducted by Akbaş and Çekilelli [43] on physical science teaching of pre-service form teachers, and the study conducted by Sandıkçı and Öncü [54] on the occupational self-efficacy perceptions of pre-service PE teachers showed that there was no difference by gender. However, many studies on academic success found that women had higher academic success than men [55, 56] as there was a positive correlation between academic success and academic self-efficacy [47-49, 57]. In our study, the differences in the academic self-efficacy perceptions of PE teacher candidates may be due to women's desire and needs to participate in the work force and obtain economic independence and participate in social life and to be liberated when social and cultural factors are taken into consideration. For this reason, female teacher candidates may feel more successful than men in their academic life.

According to ANOVA test results to compare the occupational anxiety levels of the participants by *grade level* variance; the occupational anxiety levels of second graders are significantly higher than the levels of first and fourth graders in the total scores of Occupational Anxiety Scale. Although there is no significant difference between classes in terms of "appointment-oriented anxiety" sub-scale of Occupation Anxiety Scale, it is interesting that the severity of occupational anxiety is constantly increasing (Table 4). In analogy to our study results, another study on the occupational anxiety of pre-service form teacher candidates showed that occupational anxiety differed depending on grade level variance [9]. Nonetheless, some studies concluded that occupational anxieties did not differentiate in terms of grade level variance [17,18]. In our study, it can be interpreted that PE teacher candidates experience a continuous occupational anxiety starting from the first years in the profession, and since occupational anxiety level differ between the grades, it reaches up to the optimum level in 2nd grade and "appointment-oriented anxiety" doesn't differ between the grades. PE teacher candidates' experience of a lasting occupational anxiety might negatively affect their attitudes towards the teaching profession as there is a middle-level negative correlation between the attitudes towards the profession and occupational anxiety [17].

Although the academic self-efficacies of the participants do not show a continuous increase in terms of grade level variance, the 4th graders differ from 1st and 2nd graders only in "technical skills" sub-scale (Table 4). In the previous studies on academic self-efficacy, a significant difference depending on the grade levels was also observed [45-47]. It can be interpreted in this ongoing study that the continuous increase in the technical skills of the candidates depending on their grade levels and the significant differentiation in the final grade are related to training and education that the candidates receive. In other words, PE teaching departments gradually increase their efficiency in teaching PE teacher candidates so that they acquire better technical skills every year.

For the comparison between the scores that participants get from the Occupational Anxiety Scale, the sub-scale and

the variables of "*sports"* and *"participation in social and cultural activities"*, the results of Table 5 reveal that only in *"economic/social anxiety"* sub-scale, the anxiety scores of those who do not participate in activities are significantly higher than the participants. Despite our findings, the study conducted by Kafkas et.al [20] with PE teacher candidates reported that active participation in sports had no impact on occupational anxiety. The literature review indicates that the participation in social and cultural activities are effective in mitigating anxiety and coping with stress [58, 59]. In our study, it can be stated that the findings suggesting that the anxiety level of PE teacher candidates, who do not participate in sport, social and cultural activities, is significantly higher than those who participate in the activities are compatible with the findings of literature review; and this difference can be explained by the fact that the socialization skills of those who do not participate in social activities are less developed as they lack social interaction. The analysis of the academic self-efficacy of the participants with regard to the variable of "participation in sports", "social and cultural activities" showed that those who participate in the activities received significantly higher scores in "social status" and "technical skills" sub-scales than those who did not participate (Table 5). Individuals can gain a lot of knowledge and skills through participation in sports, social and cultural activities, and they can also be influential in acquiring a social role. Participation in such activities is also thought to be effective in obtaining some technical skills; which might explain the significant difference between the groups.

In terms of subjective academic achievement variable, the anxiety levels of those, who consider their anxiety levels as "poor" in the total score and "job-oriented anxiety", "interaction with students", "individual self-development" and "appointment-oriented anxiety" sub-scales of Occupational Anxiety Scale, are significantly higher than those who consider their anxiety levels as "good" *(Table 6).*

The previous studies already showed that there was a mid-level correlation between occupational anxiety and self-efficacy [20], and a negative correlation between the occupational self-efficacy perception and occupational anxiety levels of the form teacher candidates [9,16]. Sandıkçı and Öncü [54] also compared the occupational competency and the attitudes of PE and other field teacher candidates, and revealed that those who had higher academic achievements had better perception of self-efficacy and competency than those who had lower academic achievement. Psychologically, people who have high anxiety levels develop low level of the competence perceptions [2, 23]. In our study, those with low academic achievement have a higher vocational anxiety score. If the issue of appointment is resolved, or the academic achievement of PE teacher candidates is improved, then the candidates will have lower level of professional anxiety.

In terms of the total and the sub-scale scores of Academic Self-Efficacy Scale, the results indicated that PE teacher candidates, who subjectively evaluate their academic achievements as "good", have significantly higher scores than those who evaluate their academic achievements as "middle" or "poor". Academic self-efficacy is defined one's self-competency and self-belief in his/her successful accomplishment of academic tasks that are assigned to him/her during education period [32]. The previous studies stated that individuals, who have higher levels of academic self-efficacy, show higher academic performance [47], and there is a positive correlation between self-efficacy perceptions and life-long learning motivations of teacher candidates [60], and between academic self-efficacy and academic motivation [61]. The result of another study conducted on the academic self-efficacy of teacher candidates concluded that those who had better academic achievements (81-90 points) significantly differed from those who had middle (71-80 points) or poor (61-70 points) achievements [42].

Research question 3. "Is there a correlation between the occupational anxiety levels and academic self-efficacy perceptions of the participants?"

The results of correlation analysis show that there is a negative and significant correlation between the scores of Occupational Anxiety Scale and Academic Self-Efficacy Scale *(Table 7).* In other words, an increase in the occupational anxiety scores of the participants may result in a decrease in their self-efficacy scores. The results of previous studies also indicated that those who had higher academic self-efficacy scores also had better academic achievements [47-49]. Another study conducted on teacher candidates reported that the academic self-efficacy perceptions of teacher candidates were negatively affected by occupational exam anxiety [42]. Considering the fact that mid-level anxiety can have a positive impact on performance, and low and severe anxiety can have a negative impact on individuals' performance [23], the results of our study show that there is a negative and significant correlation between occupational anxiety levels and academic self-efficacy perceptions of the participants; which can be interpreted that PE teacher candidates, who participate in our study, experience a high level of occupational anxiety. This result also shows that the high level of occupational anxiety can negatively impact the participants' academic self-efficacy and thus decrease their performance, and the achievement of general and specific teaching skills expected from teacher candidates.

5. Conclusions

The fact that PE teacher candidates experience higher level of appointment-oriented anxiety has a negative impact on their academic self-efficacy. The fact that candidates have been constantly anxious since the first day they started university also negatively affects their academic self-efficacy. Besides, the participants' low scores in

"technical skill" sub-scale are regarded being due to the lack of practice and technology usage experience. It can be concluded that the participation in social, cultural and sports activities can create a positive impact on occupational anxiety and academic self-efficacy, and academic self-efficacy can help improve academic achievement. As a result, in order to decrease vocational anxiety levels of physical education teacher candidates, it is suggested to solve the problems of appointment-oriented anxiety and to take necessary precautions to increase academic achievement.

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Relationship between Teacher Views on Levels of Organizational Support - Organizational Identification and Climate of Initiative

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Abstract This study aimed to identify secondary school teachers' views on levels of organizational support, organizational identification and climate of initiative and to determine whether there were any significant differences between these views based on teachers' demographic characteristics and whether there were significant differences between teachers' climate of initiative levels and levels of their organizational support and organizational identification. Universe of the study conducted with relational screening model was composed of teachers (n=240) employed in Bolu province Anatolian High Schools during 2014–2015 academic year. Organizational Support, Organizational Identification and Climate of Initiative Scales were used in the study as data collection tools. According to research results, teachers were "undecided" in their organizational identification and climate of initiative levels, "agreed" with the organizational support level total scale and its instructional support and justice support sub dimensions and "partially" agreed with the administrative support dimension. While there were no significant differences in teacher views on climate of initiative, organizational support and all its sub dimensions based on gender, marital status, level of education, professional seniority, age and union membership variables, significant differences were identified on organizational identification levels based on age and level of education variables. A low level, positive meaningful relationship was identified for teachers' climate of initiative, organizational identification and total support, support administrative and support justice levels which are organizational support sub dimensions and no significant relationships were detected with instructional support levels.

Keywords Organizational Support, Organizational Identification, Climate of Initiative, Teacher

1. Introduction

Teachers' roles and responsibilities in today's system of education are increasing day by day in the process and schools as institutions, students and parents expect teachers to display high performance in performing these duties. As individuals, teachers are having a hard time in the face of these escalating roles. In order to transform these responsibilities to achievements, teachers expect support from their organizations and their administrators at a level that can meet their needs and expectations, that can provide opportunities for professional development in academic terms and that can create a peaceful and happy work environment which will ensure that teachers are valued and paid attention to. Teachers' organizational support perceptions related to their organizations and creation of organizational identification and climate of initiative levels are regarded as important concepts for organizational achievement and its future performance and the degree how much these concepts are taken into consideration in providing teachers with positive work climate in their organizations is investigated. Hence, existence of teachers, one of the most important elements of education system, who are aware of the support they can receive dominantly from school administration, parents and the school environment, who are motivated to provide active and successful education by identifying themselves with their organizations, who exert efforts to be more effective in line with the goals of their organizations and who contribute to the increase in the quality of education and training by taking more initiatives is crucial to target a successful future in the field of education both for educational organizations and for the country.

1.1. Organizational Support

Teachers are the building blocks of the training and education process and their attitudes towards school and the

development of their sense of belonging to school via integration positively affect their performances. In addition, school administrators' positive approaches to teachers, having teachers participate in decisions made in schools and giving teachers support and responsibility highly affect teachers' job satisfaction and organizational commitment and play a significant role in this sense to increase the quality and effectiveness of education and training [33]. Teachers develop a positive attitude towards their schools when they are provided with a suitable work climate and when they feel they are supported by the school administration. Therefore, the concept of "organizational support" is at the forefront in creating positive perceptions in teachers towards their organizations. The concept of organizational support is employees' belief that the members of the organization value them and care for their wellbeing [31], the awareness of an organization about the contributions of employees and its caring for the well-being of employees [66] and the level of perception related to organizational commitment of the organization towards its employees that develops in time in employees via their integration with their organizations [17]. The concept of organizational support is defined as employees' awareness that the organization supports them and recognizes their contributions, meets the employees' needs for belonging, respect and validation by making them feel that the organization cares for their well-being and it is happy to be working with them [6], as employees' reciprocation of high level of commitment and performance towards organizational activities that are deemed to be useful for them [80] and as employees' positive perceptions towards contributions, approval, feelings and information from various sources [77]. When employees know that their ideas are noticed and their criticisms are taken into consideration to influence changes in the organization, they will receive it as support and their performance will increase along with their sense of belonging to the organization [70]. In school environments, administrators need to be influential on teachers to realize organizational goals by increasing teachers' commitment and meeting their needs [48; 73]. Meeting the needs of employees, noticing their contributions and looking after their interests will result in positive reciprocations for the organization [71]. Value given to employees by the organization is a sign that employees are recognized and approved [23]. On the other hand, in work environments where organizational support is not sufficiently perceived, mutual trust and sharing are nonexistent between the individual and the organization, employees feel unvalued and that situation is negatively reflected on their performances [90]. With the help of shared cultural elements and received organizational support, members of a school are integrated with the school and its goals and contribute to the development of humanitarian feelings such as friendship, sincerity, trust and ensure the formation of we-feeling instead of promoting the sense of self [92]. With the help of support received from their organization, teachers in the school environment are engaged in activities that are useful for their organizations such as making suggestions to improve their climate, participating in meetings willingly, approaching their colleagues positively and helping them in their work [71]. It is observed that when teachers perceive organizational support positively, they spend time together and increase the trust and affinity among them. This generates the social climate that is sought in the organization and communication is ongoing with the programs and social activities they arrange among themselves. In this context, teachers are take pride in and feel happy from the organizational support they receive and their level of welfare [2] and they will adopt behaviours that will be approved by the organization and that will benefit their organizations since they will identify their goals and the goals of the organization.

1.2. Organizational Identification

Meeting the needs of teachers by educational organizations is associated with the climate and culture of the organization in question. Schools have specific expectations from teachers such as having skills like expressing oneself, being creative and being able to work in a team. In order for teachers to meet these expectations, the academic expression, climate and atmosphere that the school offers are significant. Hence, it is imperative to realize that the schools should provide the crucial conditions for teachers to do their duties and understand the factors that inhibit teachers from doing so. Educational administrators and the organizational climate should affect teachers, ensure that teachers participate in the service and therefore increase their productivity. Educational organizations have to meet teachers' economic, physical, social and psychological needs in order to reach their goals. Teachers who felt approved, liked and respected in the organization become happy and productive by knowing that they have reached this level as a result of the services they provide. Hence, teachers identify with their profession by keeping their morale high via sense of achievement [86]. Increases in organizational identification results in the increase of acting and thinking from an organizational perspective [29]. Organizational identification is defined as the cognitive connection between the individual and the organization [29]. The general understanding about organizational identification is that it is generated when individuals feel as a part of the organization and form psychological ties with the organization [18; 97] in the framework of cognitive, affective and behavioral factors [95]. Affective commitment of employees that identify with their organizations and high level of overlap between employees' needs and thoughts with those of organizational goals [26] become meaningful for them and therefore provide more positive motivation to increase their desire to keep working at the organization. In this scenario, the possibility of favoritism lessens and employees are directed on their own

to behaviors that support their organization and exert efforts for the benefit of their organizations voluntarily [49]. Identification provides the opportunity for employees to realize organizational goals and activities by individually adapting to organizational goals and values. Also, individuals remove any uncertainty by accepting organizational objectives and values. When interacting with outsiders, individuals who identify with their organizations highlight the interests of the organization at times related to strategic and business decisions by regarding themselves as the representatives of their organization, on the other hand, administrators of the organization avoid people who are against the values and goals of the organization [61]. Full identification of individuals with their organizations by completely adopting mutual beliefs, attitudes, values and goals, i.e. high levels of organizational identification, means that the individual will defend the organization in various platforms by voluntarily giving all kinds of support and will exert any efforts to ensure that the organizations reach its goals. As a result of such behaviors that will be presented by individuals, it is expected that productivity and performance will increase in the organization, the costs will decrease, high level coordination and cooperation will be ensured and the organization will adapt to environmental changes more easily, which means that organizational performance is expected to increase in almost all domains [34]. As a result, studies in the field reported that organizational identification increased organizational performance positively and developed organizational integrity since it provided feelings of happiness in employees [81].

1.3. Climate of Initiative

It is observed that employee performance increases in work climates where employees take the initiative and their creativity is supported by their organizations [84]. Teachers who are in a sharing position with their organizations and who can take the initiative when necessary have positive thoughts towards their organizations and aim to take responsibility in increasing the achievements of the organization by working in harmony with their colleagues. Hence, this positive climate provided by the organization with their employees plays an important role in increasing performance for both teachers and the organization. The organization will act as the locomotive to ensure that the individual and organizational goals are reached by putting the mutual decisions made by school administration and teachers into practice and by ensuring synergy. Climate of initiative can be expressed as teachers' overcoming the barriers they faced by displaying behaviors for the benefit of the organization. As a result of the positive work climate formed between the organization and the individual, the individual goes beyond the formal roles required by the task and presents adamant behaviors to accomplish the task and completes the process successfully [39; 40]. It is also observed that performance increases in work climates where individuals take the initiative in organizations and their work is supported [84]. Having organizational climate at the desired level is a significant concept in organizational achievement for both theoretical and practical reasons [39]. Taking the initiative is the act of completing tasks for the benefit of the organization without guidance from an administrator [89]. Initiative is characterized as the quality of individuals who can focus on goals to be achieved and take risks for the organization when required [39]. Climate of initiative is related to individuals' taking responsibility in the organization [63]. Individuals' taking responsibility in the organization, feeling responsible towards their organization, keeping personal interests in the background in actions are important in the concept of initiative as well as the feelings of impartiality evoked by the administration in individuals who benefit the organization [63]. Climate of initiative is the display of active roles voluntarily by individuals to reach desired goals or remove obstacles [38; 40]. Climate of initiative is the tendency of employees in job environments to display more decisive behaviors [45]. Climate of initiative is defined as the work behavior in the quest of a goal that arises on its own to remove obstacles [39]. Climate of initiative can be regarded as another form of employees' proactive behavior directed for a permanent goal focusing on the task at hand [68]. It is defined as employees' taking the initiative to develop or form new conditions [13]. It is determined that employees with various behaviors and tendencies display a different attitude by taking the initiative after identifying a common goal for the organization [13]. These types of behaviors aim to develop individuals' personal prerequisites in addition to developing specified work methods and procedures in order to foresee the future [88]. Climate of initiative is the activation of personal responsibilities for employees to increase their performances actively [38]. The concept is also explained as expansion employees' concept of performance and taking on the initiative for various extra role performances in changing job conditions [40]. Individuals who take personal initiatives go beyond their responsibilities and aim to overcome obstacles in reaching their goals with self-initiation and active approach. It is observed that these individuals have high academic achievement and self- confidence [104]. Individuals who are engaged in sharing with their organization and who can take the initiative inside the organization when necessary maintain positive feelings towards their organizations and aim to take responsibility by working in harmony with other employees to increase the success of the organization. Therefore, this positive climate obtained by the organization plays an important role in increasing performance in both the organization and in employees. The organization will act as the locomotive to ensure that the individual and organizational goals are reached by putting the mutual decisions made by the administration and individual into practice and by ensuring

synergy.

1.4. Relationship of Organizational Support, Organizational Identification and Climate of Initiative

Individuals need to receive support from their organizations. With organizational support, individuals meet their affective needs such as being respected, approved and recognized and valued. With the support it provides, the organization states that it is aware of employees' performances, it cares for their wellbeing and it is satisfied working with them in line with organizational goals and meets vital employee needs such as respect and approval of colleagues and administrators in the organization that are crucial for organizational success [71]. Individuals appreciate the support given to them and their colleagues by the organization and exert efforts to identify more with their organization. The individuals who identify with their organization increase their performance without experiencing any problems by taking short and long term goals and values of the organization into consideration and try to introduce the obtained achievements as the success of the organization without thinking of them as personal achievements. Teachers' identification with their schools will primarily increase communication among colleagues, feelings of acting together and responsibility for and commitment to their organization as well as moving the efficiency and effectiveness of the organization to higher levels. When teachers act to increase the level of achievement in their organization by identifying themselves with the organization with the support they receive from their schools, they face with many challenges. Faced by these problems, teachers prevent the organization from negative impacts and deviating from specified goals by taking personal initiatives. Teachers make plans using foresight to save the organization from unexpected negative conditions and try to overcome problems. However, teachers have better performances when administrators appreciate these behaviors and value their suggestions and act as a locomotive for organizational success by not abstaining from going one step further. Especially in recent years, teachers have faced many innovations that have abruptly developed during the education and training process and they devote themselves to ensure the quality of the organization and education do not fall behind in the process. However, in order for teachers to continue these self-abnegating behaviors, they need to receive physical and technical support from school administration and they need a positive organizational climate in which they can identify with the school and take initiative. It is also believed that teachers who identify with their organizations and who are fairly supported by school administrations in the education and training process will take on more responsibility and initiative in the realization of short and long term goals of the country.

Literature review shows organizational support has been investigated in terms of organizational commitment [79; 15; 73; 82; 1; 109; 42; 70; 99; 57; 100; 67; 22; 21; 51], intention to leave [79; 74; 107; 17], identification [72; 97;36; 78; 65; 46], organizational citizenship [85], organizational commitment [14], loneliness [54], trust [7; 91; 35; 44; 30] and burn out [7; 47; 69]. Organizational identification has been studied together with job satisfaction [56; 20], organizational image and citizenship [52; 53; 64; 93; 106], organizational trust [98; 24; 94; 108; 101] and intention to leave [16; 76; 96; 87]. It is observed that climate of initiative is a new field in literature and has been studied with concepts such as organizational support and trust [59] and creativity [11]. In the light of this information, no study that has investigated organizational support, identification and initiative levels together was found both in national or international level. Hence this study is significant for contributing to the field in this sense.

This study is significant to provide teachers with a new perspective to teaching profession with the support they receive from their organizations, to create new research fields related to organizational support, identification and taking initiative levels for administrators and teachers in educational institutions and provide suggestions which can be implemented. It is believed that organizational support provided by the organization for its employees will prove to be beneficial when it is sufficient and honest and it will be possible to evaluate these acquisitions. Organizational support provided for teachers is believed to increase their interest and commitment to the organization as long as they work in the organization and it will be instrumental in realizing organizational goals.

In this context, this study aimed to identify teacher views on levels of organizational support, organizational identification and climate of initiative and to determine whether these views significantly differed based on demographic variables. Answers to questions provided below were sought with this aim in mind.

1. What are teacher views on the levels of organizational support, organizational identification and climate of initiative?
2. Do teacher views on the levels of organizational support, organizational identification and climate of initiative significantly differ based on independent variables (gender, marital status, professional seniority, level of education, union membership)?
3. Is there a meaningful relationship between teacher views on climate of initiative and levels of organizational support and organizational identification?

2. Method

2.1. Research Method

This quantitative study employed relational screening

model to investigate whether high school teachers' views on the levels of organizational support, organizational identification and climate of initiative differed based on different variables. Relational screening model is defined as a research model that aims to identify the existence and/or degree of change between two or more variables. Relational analysis is done by using correlation type relations or comparisons in relational screening models [12; 55]

2.2. Study Universe

The universe of the study was composed of teachers employed in six Anatolian High Schools (expect for science high school and vocational technical schools) in Bolu central district during 2014-2015 academic year. The reason for selection of these high schools is structural similarity. A total of 217 teachers were distributed the data collection tool to make sure all the universe was contacted and 240 of these tools were assessed. Accordingly, return rate was calculated as 92,25%. Based on Krejcie and Morgan [58], this return rate is sufficient to represent the universe.

Examination of the personal information shows that 136 of the participating teachers were (56,7%) female, 104 were (43,3%) male; 190 were (79,1%) married, 51 were (20,9%) single;193 were undergraduate (80,1%), 47 were (18,9%) post graduate; 175 had (72,6%) union membership and 65 did not have (26,6%) any union membership. Also, 74 of the participating teachers (30,8%) had 0-10 years seniority, 53 had(22,1%) 11-15 years seniority; 58 had (24,2%) 16-20 years seniority; 29 had (12,1%) 21-25 years seniority and 26 had (10,8%) 26 years or more seniority.

2.3. Data Collection Tools

A question form with four sections was used in the study as data collection tool. The first section includes demographic variables. The other two sections include Organizational Support Scale to measure the degree of support employees receive in the organization and Organizational Identification Scale to measure teachers' organizational identification and the last section includes Climate of Initiative Scale to determine the level of initiative taking in the organization by employees. Personal information form included questions to determine information thought to be relevant to research results such as gender, age, marital status, union membership, professional seniority and level of education.

Organizational Support Scale was developed by Derinbay [27] and it consists of 29 items. The reliability Cronbach Alpha internal consistency coefficient was established as, 95. The three sub dimensions for Organizational Support Scale are as follows: instructional support (items 1-9), administrative support (items 10-18), and justice support (items 19-29). In this study, Cronbach Alpha internal consistency coefficient was calculated as α:,92 with values for sub dimensions changing between,73 and ,93. Organizational Identification Scale has 11 items and the scale was translated to Turkish by Loga [60] using the first 8 items from the study of Fred Mael and the remaining 3 items from the studies of Massimo Bergami and Richard P. Bagozzi. The scale is one-dimensional. Reliability and construct validity of the scale was established by Loga [60] and Cronbach Alpha internal consistency coefficient of the scale was found to be, 87.,84. Climate of Initiative Scale was translated into Turkish by Kurt, Duyar and Yakut [59] by utilizing the studies by Frese, Fay, Hilburger, Leng and Tag [40]. Climate of Initiative Scale consists of 7 items and it is a 5 point Likert type scale. Cronbach Alpha internal consistency coefficient of Climate of Initiative Scale was calculated as, 87. In this study, Cronbach Alpha internal consistency coefficient of the scale was calculated as, 92.

2.4. Data Collection

Required permits were received from Bolu National Directorate of Education for the study. Data collection tool was personally distributed by the researcher by visiting the 6 high schools located in the central distinct. The schools were revisited to collect the completed scales and they were personally collected by the assistance of school administrators and teachers. Data collection tool was distributed to all teachers at 6 schools and voluntary nature of participation was emphasized.

2.5. Data Analysis

Before data analysis, Kolmogorov-Smirnov Normality Test was conducted to determine whether data displayed normal distribution and it was observed that data did not show normal distribution. Hence, non-parametric tests were used in data analysis. Frequencies (f) and percentage (%) values were calculated for personal information. Means ($\bar{X}$) and standard deviation (SD) values -descriptive statistics- were used for teachers' organizational support, organizational identification and climate of initiative levels. Kruskal Wallis and Mann Whitney U tests were utilized to compare teacher views based on independent variables. Spearman's Rank Correlation Coefficient was utilized to determine whether there were relationships between obtained views. Score intervals used in data analysis for teachers' data in organizational support, organizational identification and climate of initiative scales were as follows; 1,00–1,79 Completely disagree, 1,80–2,59 Disagree, 2,60–3,39 Undecided, 3,40–4,19 Agree and 4,20–5,00 Completely agree.

3. Findings and Discussion

This section includes findings and interpretations related to data analysis for the research problem in terms of sub problems.

3.1. Teacher Views on the Level of Organizational Support, Organizational Identification and Climate of Initiative

Data pertaining to teacher views on the first sub problem of the relationship between teachers' organizational support and organizational identification levels and climate of initiative were presented in Table 3 as arithmetic means and standard deviation values.

Table 1. Results of descriptive statistics for the relation between levels of teachers' organizational support and organizational identification and climate of initiative

Scale	Sub Dimension	N	$\bar{X}$	SD
Identification		240	3,36	,67
Climate of Initiative		240	3,09	,28
Organizational support	Instructional support	240	3,40	,54
	Administrative support	240	3,24	,42
	Justice support	240	3,45	,71
	Total	240	3,49	,72

Table 1 shows that teachers were "undecided" about their organizational identification levels with ($\bar{X}$=3,36) means. Based on this finding, it is believed that this situation is related to differences in working hours in addition to factors such as sense of belonging to their schools, climate, administrator and colleagues. Teacher views on their organizational support levels shows "agreement" on the sub dimensions of organizational support: justice support ($\bar{X}$=3,50), instructional support ($\bar{X}$=3,40) and total support ($\bar{X}$=3,49) but it was found to be "partial" agreement on administrative support ($\bar{X}$=3,09). It is observed that teachers were "undecided" about climate of initiative levels ($\bar{X}$=3,09).

3.2. Teacher Views Based on Personal Variables

3.2.1. Gender Variable

Results of Mann Whitney U test conducted to identify the relationship between teachers' levels of organizational support and organizational identification and climate of initiative based on gender are presented in Table 3-2.

Table 2 shows no significant differences in teacher views based on gender in organizational identification (U=6501,50; p>0.05), climate of initiative (U=6632,00; p>0.05) and organizational support total (U=6931,50; p>0.05) and the sub dimensions instructional support (U=6761,50; p>0.05), administrative support (U=7041,00; p>0.05) and justice support (U=6921,50; p>0.05).

3.3. Marital Status Variable

Table 3 provides the results of the tests conducted to identify the relationship between teachers' levels of organizational support and organizational identification and climate of initiative based on marital status.

Table 2. Mann Whitney U test results for the relationship between teachers' levels of organizational support and organizational identification and climate of initiative based on gender.

Scale	Sub Dimension	Sex	N	Mean Rank	U	*p*
Identification		Female	136	116,31	6501,50	,28
		Male	104	125,99		
Climate of Initiative		Female	136	117,26	6632,00	,40
		Male	104	124,73		
Organizational support	Instructional Support	Female	136	118,09	6761,50	,62
		Male	104	122,49		
	Administrative Support	Female	136	120,73	7041,00	,95
		Male	104	120,20		
	Justice Support	Female	136	119,39	6921,50	,77
		Male	104	121,95		
	Total	Female	136	119,34	6931,50	,86
		Male	104	120,85		

Table 3. Mann Whitney U test results for the relationship between teachers' levels of organizational support and organizational identification and climate of initiative based on marital status.

Scale	Sub Dimension	Marital Status	N	Mean Rank	U	*p*
Identification		Married	189	126,95	3,74	,44
		Single	50	93,73		
Climate of Initiative		Married	189	121,52	1,58	,81
		Single	50	114,25		
Organizational support	Instructional Support	Married	189	118,06	1,45	,83
		Single	50	124,93		
	Administrative Support	Married	189	117,54	5,91	,20
		Single	50	129,28		
	Justice Support	Married	189	119,53	5,01	,28
		Single	50	121,76		
	Total	Married	189	117,68	5,31	,25
		Single	50	126,34		

Table 3 shows no significant differences in organizational identification (U=3,74; p>0.05), climate of initiative (U=1,58; p>0.05), total organizational support (U=5,31; p>0.05) and sub dimensions instructional support (U=1,45; p>0.05), administrative support (U=5,91;p>0.05) and justice support (U=5,01;p>0.05) based on marital status variable. It can be argued that lack of a significant difference means marital status is not an effective variable on teacher views.

3.4. Level of Education Variable

Table 4 provides the test results conducted to identify the relationship between teachers' levels of organizational support and organizational identification and climate of initiative based on level of education variable.

Table 4 displays no significant differences in teachers views on climate of initiative (U=4367,00;p>0.05), and organizational support sub dimensions: instructional support (U=4026,50;p>0.05), administrative support (U=4437,00;p>0.05), justice support (U=4451,50;p>0.05) and total organizational support (U=4441,50; p>0.05) based on level of education. Lack of a significant difference in this regard may mean that level of education variable is does not affect teacher views. On the other hand, a significant difference was detected in the level of organizational identification (U=3360,50; p<0.05) based on level of education between teachers with undergraduate training and post graduate training in favor of teachers with undergraduate training.

Table 4. Mann Whitney U test results for the relationship between teachers' levels of organizational support and organizational identification and climate of initiative based on level of education.

Scale	Sub Dimension	**Level of education**	**N**	**Mean Rank**	**U**	***p***
Identification		Undergraduate Post graduate	193 47	126,59 95,50	3360,50	,00*
Climate of Initiative		Undergraduate Post graduate	193 47	119,63 124,09	4367,00	,69
Organizational support	Instructional Support	Undergraduate Post graduate	193 47	117,47 130,33	4026,50	,25
	Administrative Support	Undergraduate Post graduate	193 47	119,99 122,60	4437,00	,81
	Justice Support	Undergraduate Post graduate	193 47	120,94 118,71	4451,50	,84
	Total	Undergraduate Post graduate	193 47	119,63 121,50	4441,50	,86

Table 5. Kruskal Wallis test results for the relationship between teachers' levels of organizational support and organizational identification and climate of initiative based on professional seniority

	Sub Dimension	Professional Seniority	N	Mean Rank	df	×2	p	Significant differences
Identification		0-10 11-15 16-20 21-25 26- +	74 53 58 29 26	113,89 111,82 125,71 137,34 126,60	4	3,74	,44	--
Climate of Initiative		0-10 11-15 16-20 21-25 26- +	74 53 58 29 26	128,32 118,71 115,65 120,07 113,21	4	1,58	,81	--
Organizational support	Instructional Support	0-10 11-15 16-20 21-25 26- +	74 53 58 29 26	114,82 128,99 117,96 122,86 117,69	4	1,45	,83	--
	Administrative Support	0-10 11-15 16-20 21-25 26- +	74 53 58 29 26	107,77 120,40 137,04 117,38 123,52	4	5,91	,20	--
	Justice Support	0-10 11-15 16-20 21-25 26- +	74 53 58 29 26	106,98 123,58 133,53 120,81 123,29	4	5,01	,28	--
	Total	0-10 11-15 16-20 21-25 26- +	74 53 58 29 26	106,08 122,88 133,48 121,22 122,83	4	5,31	,25	--

Table 6. Mann Whitney U test results for the relationship between teachers' levels of organizational support and organizational identification and climate of initiative based on union membership.

Scale	Sub Dimension	Union Membership	N	Mean Rank	U	*p*
Identification		Yes No	175 65	123,01 113,73	5247,50	,35
Climate of Initiative		Yes No	175 65	119,33 123,65	5483,00	,66
Organizational support	Instructional Support	Yes No	175 65	123,36 111,01	5070,50	,21
	Administrative Support	Yes No	175 65	123,53 112,35	5158,00	,26
	Justice Support	Yes No	175 65	124,82 108,87	4931,50	,11
	Total	Yes No	175 65	123,78 109,87	4996,50	,16

Table 7. Table of Correlation Analysis for teachers' climate of initiative and levels of organizational support and organizational identification

		Identification	Organizational support Total	Instructional Support	Administrative Support	Justice Support
Climate of Initiative	r	,17*	,27**	,01	,29**	,28**
	p	,01	,00	,92	,00	,00
	N	240	240	240	240	240

3.5. Professional Seniority Variable

Table 5 provides the test results conducted to identify the relationship between teachers' levels of organizational support and organizational identification and climate of initiative based on professional seniority variable.

Table 5 shows no significant differences in teacher views on organizational identification [X^2(sd=2.n=371)= 3,74; p>0.05], climate of initiative [X^2(sd=2.n=371)= 1,58; p>0.05], total organizational support [X^2(sd=2.n=371)= 5,31; p>0.05] and sub dimensions of organizational support; instructional support [X^2(sd=2.n=371)= 1,45; p>0.05], administrative support [X^2(sd=2.n=371)= 5,91; p>0.05] and justice support [X^2(sd=2.n=371)=5,01; p>0.05] based on professional seniority.

3.6. Union Membership Variable

Table 6 provides the test results conducted to identify the relationship between teachers' levels of organizational support and organizational identification and climate of initiative based on union membership variable.

Table 6 displays no significant differences on teacher views of union membership on organizational identification (U=5247,50;p>0.05), climate of initiative (U=5483,00;p>0.05), total organizational support (U=4996,50; p>0.05), and the sub dimensions of organizational support: administrative support (U=5158,00;p>0.05), justice support (U=4931,50;p>0.05) and instructional support (U=5070,50; p>0.05) based on union membership. Lack of significant differences in this regard may mean that this variable does not affect teacher views.

3.7. Relationship of Teacher Views on Climate of Initiative and Levels of Organizational Support and Organizational Identification

Table 7 presents the data obtained from the correlation analysis conducted to determine whether there were significant differences between teachers' climate of initiative and levels of organizational support and organizational identification

Table 7 shows low level, positive and significant relationships between teachers' climate of initiative and their organizational support and organizational identification levels. Examination of the relationship of teacher views on climate of initiative and their views on organizational identification, organizational support and their sub dimensions presents the following findings: A low level, positive and significant relationship was found between teacher views on climate of initiative and their views on identification levels (r=,17; p=,010). A low level, positive and significant relationship was detected between teachers' initiative levels and their organizational support levels (r=,27; p=,000). No relationship was found for teachers' initiative levels and their instructional support levels (r=,01 p=,926). A low level, positive and significant relationship was found between teachers' climate of initiative and administrative support levels (r=,29; p=,000). A low level, positive and significant relationship was found between teachers' climate of initiative and justice support levels (r=,28; p=,000).

4. Discussion

Findings of the current study which aimed to identify teacher views on organizational support, organizational

identification and climate of initiative levels and to determine whether these views significantly differed based on demographic variables are presented in this section and discussed with the help of relevant literature.

According to research results, teachers "agreed" with organizational support level total scale and its instructional support and justice support sub dimensions and "partially" agreed with the administrative support dimension. The sub dimension with the highest means was found to be justice support and the sub dimension with the lowest means was found to be administrative support. Examination of relevant studies shows that also in Eğriboyun [30], Derinbay [27] and Nayır's [67] studies teachers agreed with organizational support level total scale. In these studies, they were undecided about their organizational identification levels. It is observed that teachers have low level identification with their schools. Relevant studies present the following findings: teachers' identification with their schools was found to be at medium level in Yıldız [106] and Akpınar's [3] studies, at normal level in Yetim's [105] study and at high level in Ekinci's [32] study where they agreed with the level of organizational identification.

Teachers were "undecided" in their climate of initiative levels. This finding may be interpreted in a manner that teachers display recessive behaviors in assessing the opportunities that may benefit their organizations, providing solutions when faced with problems, feeling responsible towards the organization and taking the initiative when required. Frese, Fay, Hilburger, Leng and Tag [40] and Frese and Fay [39] reported that teachers have normal levels of taking the initiative and feeling responsibility towards their organizations.

No significant differences were found in teachers' organizational identification, climate of initiative levels and in all sub dimensions of organizational support and in the total scale based on gender. However, it was observed that levels of male teachers were found to be higher than those of female teachers in organizational identification, climate of initiative levels and in all sub dimensions of organizational support and in the total scale. This finding may be interpreted that male teachers internalize their work environments more than their female counterparts do, embrace the achievements of the school more and spend more time with administrators by displaying a positive stance towards them. Relevant studies also show that teachers' views on level of organizational identification [9;18; 71; 105; 25; 32; 98; 72; 46] do not differ based on gender, [65; 3; 49; 56; 36] but there were significant differences in some studies in favor of male teachers. Studies on organizational support also show that according to teacher views, gender is not regarded as a variable that creates difference [97; 30; 27; 67; 37; 65].

No significant differences were found in teachers' organizational identification, climate of initiative levels and in all sub dimensions of organizational support and in the total scale based on marital status. However, it was observed that organizational support of single teachers were higher than that of married teachers in sub dimensions of organizational support (instructional support, administrative support, justice support) and in the total scale and that organizational identification and climate of initiative levels of married teachers were higher than those of single teachers. This finding can be interpreted that married teachers can take up extra responsibilities in activities organized for the benefit of their organizations to ensure the success of their organizations whereas single teachers, without thinking of taking the initiative for the benefit of their organization, prefer individual activities outside it in their free times.

At organizational identification level, it can be argued that male teachers identify with their organizations, form positive ties with their organization and present voluntary behaviors in the activities organized on behalf of their organizations, On the other hand, single teachers have lower perceptions of identification compared to their married counterparts due to personal reasons such as being new in their jobs, having higher expectations and disliking the organization they work in. Relevant studies show that according to teacher views, teachers' organizational identification levels do not significantly differ based on marital status [9; 18; 19; 32; 25] and Demirer [25] reported that organizational identification levels of single teachers were lower than those of married teachers.

In terms of organizational support that is in favor of single teachers, it can be argued that single teachers can highlight their individual characteristics, achieve more by getting the support of administrators in the organization and display more active behaviors. Relevant studies point out that single teachers perceive more organizational support compared to married teachers based on teacher views [83; 43; 37]; however Nayır [67] reports that married teachers perceive more organizational support compared to single teachers.

No significant differences were found in teacher views on climate of initiative levels and in all sub dimensions of organizational support and in the total scale based on level of education. Examination of the relevant studies show no significant differences between teacher views on organizational support levels and their organizational support perceptions based on level of education [67; 41; 46]. Literature has parallel results to this finding. However, there is a significant difference in favor of teachers with undergraduate degrees at organizational identification level. On the other hand, it is observed that in climate of initiative levels, in organizational support sub dimensions such as instructional support and administrative support and in the total scale it was found that teachers with postgraduate degrees had higher levels compared to teachers with undergraduate degrees. Compared to teachers with postgraduate degrees, teachers with undergraduate degrees were found to have higher levels in organizational identification levels and justice support dimension. This finding may be show that teachers with postgraduate degrees can spend time with their administrators, students and colleagues and take up initiatives and responsibilities outside

their realm of duties to work for increasing the achievements of the school and exert efforts in line with organizational goals. According to Polat [78], teachers with higher levels of education may not identify with their organizations and have lower levels of identification with their schools since they have options to work elsewhere [78]. Relevant studies show that, according to teacher views, organizational identification levels decrease along with increased level of education [10; 18] and that teachers with undergraduate training identify with their organizations more. According to other studies, level of identification does not significantly differ based on level of education [65; 3; 32; 25; 98; 71; 46].

No significant differences were found in teachers' organizational identification, climate of initiative levels and in all sub dimensions of organizational support and in the total scale based on professional seniority. It can be argued that teachers' climate of initiative levels are not affected from professional seniority. On the other hand, it was observed that teachers with higher seniority had higher levels in organizational identification level and in organizational support sub dimensions (instructional support, administrative support, justice support) and in the total scale and it was found that teachers with 0-10 year initiative has higher levels of climate of initiative compared to other teachers.

The finding that teachers with higher seniority had higher organizations identification levels may be related to the fact that individuals working in one profession for long years adopt their work environments and they possess feelings of doing their job better with experience. Also, since teachers with higher seniority will have higher employment scores, they will have the chance to work in any schools that they desire to work. This will result in making plans for the future without any anxieties by creating a positive effect on teachers. Relevant studies show similar results in organizational identification levels based on teacher views [3; 65; 71; 105; 98; 72]. Other studies report that increases in professional seniority result in positive increases in identification [19; 78; 25; 32; 18; 49; 8].

It can be argued that teachers' organizational support levels are not affected from professional seniority variable. Investigation of relevant studies points that according to teacher views, organizational support levels of organizations did not statistically differ based on professional seniority [30; 27; 50; 65].

No significant differences were found in teachers' organizational identification, climate of initiative levels and in all sub dimensions of organizational support and in the total scale based on union membership of teachers. Lack of a significant difference in this regard may point that this variable does not affect teacher views. However, individuals who are members of a union will tend to regard the decisions taken by the union as binding and act with the union members in the face of any problems at the organization or regarding any tasks in question. Individuals without membership to any unions will make personal decisions in these cases without being under the influence of anyone and can take personal initiatives. It can be argued that compared to teachers without union membership or with membership of some other union, teachers with a certain union membership, with the desire to come into prominence or attract attention, create a group inside the organization to look after the organization, to become aware of existing problems and to strive to meet the deficits caused by drawbacks in physical and equipment domains. Since teachers without any union membership will not have such concerns, they may have lower levels of identification with the school administration or the organization.

Since teachers with union membership will prefer to act by taking the support of the administration in the activities they will organize or in the conventions they will make against other unions, they will present a more intimate stance to the school administration and tend to increase the support received from the management.

In terms of the relationships between teachers' climate of initiative and levels of organizational support and identification; a low level and significant relationship was found was between teachers' climate of initiative and level of organizational identification and a negative relationship was detected between teachers' climate of initiative and instructional support which is a sub dimension of organizational support. On the other hand, a positive and low level significant relationship was found between teachers' climate of initiative total support, administrative support and justice support, which are sub dimensions of organizational support.

In this context, it can be argued that teachers can be said to take more initiatives in the organization and in matters related to organization while their organizational identification levels increase. When identification is strong, the individuals identify with their organizations and define them as they would define themselves [103]. If teachers are happy with the support they receive from their organizations and they are comfortable there, they will perform more tasks and contribute to their organizations more with the help of higher job performance [102]. However, the fact that the level is low shows us that teachers do not have suitable environments in their schools to take initiative. On the other hand, teachers lose the sense of belonging to their organizations when they do not receive the expected attention and support from their organizations but they will still want to transfer professional knowledge and skills to their students based on professional sense of duty and respect although they do not plan on taking the initiative for their organizations.

Valuing members in an organization will ensure that they will meet their expectations in not feeling lonely in good or bad days and feeling the support of their organizations and it will be effective in their forming ties of affection with their organizations [97]. Organizational support requires a special approach that will make the members of the organization feel safe and backed by their organization. Organizations that

have this approach can create happier and more satisfactory work climates as a result of supporting their employees with tangible or intangible rewards for their contributions to the organization. These types of climates will ensure that employees are happier and more satisfied (Watkins, 1995, cited in: [2]). However, it is believed that when teachers' expectations are not met and when they feel they do not receive sufficient support from the organization, they will perform only the tasks that are legally binding and will not take the initiative in additional tasks for the benefit of their organizations. On the other hand, it is crucial for teachers to work in schools where they can better express themselves and where they can be of better use to their students so that successful training can be provided. Meeting teachers' needs, realizing their expectations and offering a positive psychological climate to teachers will ensure formation of a positive organizational climate. Teachers will strive to perform their tasks in the best possible manner in such positive climates [86]. School administrators have to be influential on teachers by preventing negative conditions that hinder teachers from doing their duties in order to realize organizational goals and to increase teachers' commitment to school [48]. Hence, school administrators should improve working conditions for teachers and be supportive; value teachers' views and ideas, take their complaints into consideration and attend to their problems one on one [73]. When teachers feel that the required conditions for increasing achievement are not met, such as providing the materials and equipment necessary for classes and promoting teachers' professional development, a negative climate will be generated in the organization. In this case, teachers will feel that the administrator is incompetent at physical, technical and school management levels and they will resist in team activities and will not want to take the initiative. However, teachers who love and care for their profession will take the initiative for their classes and their students under all circumstances.

Teachers expect school administrators to openly share the decisions made by them, to be consistent and to keep their promises. Hence, teachers prefer feeling psychologically comfortable in the organization and forming good relationships with their administrators. Literature cites that these good relationships will ensure that teachers will feel as a part of their organizations [75]. As long as school administrators display these behaviors, the employees feel they are supported and trust and commitment towards the leader and the organization will be generated [5]. School administrators are managers with positive characteristics who contribute to teachers' personal and professional growth, support teachers in all domains, have teachers use the education and training environment effectively and who display a collaborative attitude by having teachers participate in decision making [4]. However, teachers want to show their reaction by not taking the imitative while performing their duties due to inconsistent behavior of the administrators or when they have negative feelings for them. Individuals try to define whether they are subjected to fair treatment in the workplace and they act on this feeling of justice; it is expressed that employees' present positive attitudes towards the organization and the people in it when they feel that all employees are treated fairly [62]. On the other hand, teachers are very distant from their organizations and their administrators and do not think of taking the initiative in matters related to school due to lack of appreciation on the part of the administrators, unfair distribution of tasks and discrimination and favoritism in matters of class schedules and hall duty.

As a result, the fact that the expectations of the teachers who work successfully for the public personnel selection examination in the conditions of Turkey for many years and their expectations from their professions are very high despite the fact that they have not been able to meet these expectations, are also preventing their frustration from taking initiatives like decreasing their loyalty to their profession. In this case, teachers can prefer to carry out their daily professional activities instead of taking initiative. The fact that teachers receive post-graduate education after their undergraduate education period also raises the issue of taking similar initiatives. Teachers who cannot find what they expect in their organizations are struggling to go through other organizations by raising their education levels. In this case, teachers' incentive use levels that are not identified by the organizations they work for and who are not authorized and whose expectation levels are not met can also be decreased.

Suggestions developed in line with research results are provided below:

1. School administration should contribute to teachers to develop their professional skills, provide the conditions where teachers can make their own decisions and offer modern physical environments in which professional knowledge and skill can be implemented with the required materials and tools.
2. School administrators should direct their attitudes and tasks based on teacher behaviors and develop strategies that will guide the realization of teachers' personal goals and the goals of the organization and also specify the awards and punitive actions.
3. School administrators should plan socio-cultural activities that will cement synergy by emphasizing that the school is a unified entity with all teachers and staff and it is necessary to act together in order to achieve success
4. Arrangements should be made to ensure that teachers can pursue their academic goals and organizational support perceptions should be increased by acting with sensitivity and tolerance towards teachers' personal needs and emotions and by being fair to all teachers in all domains.
5. School administrators should listen to teachers' views and suggestions and create supportive behaviors and environments that will make teachers

feel valued and appreciated and that will provide feedback.

6. It should be ensured that teachers with higher seniority guide teachers with less seniority and synergy between them should be increased to provide higher levels of identification.
7. Future studies should be conducted to investigate and pinpoint the factors that result in indecisions on the part of teachers in taking initiative

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Using Plickers Cooperate with Peer Instruction to Promote Students' Discussion in Introductory Physics Course

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Abstract In decades Peer Instruction (PI) has been confirmed that it can improve students' conceptual understanding. Anyway the main problem for using PI is an audience responding system which required for gathering students' answer, to enhance learning process of PI instead of using Clickers which cost about 40 USD per item. In this work we decided to use Plickers: the free application in smartphones. The purpose of this research is to develop the students' conceptual understanding in work and energy by using PI strategy. The sample for this study came from the different academic year at Ubon Ratchathani University, Thailand. There were 50 first year chemistry students who have enrolled in introductory physics course in academic year of 2016 and 119 first year engineering students who have enrolled in introductory physics course in academic year of 2017. The pre-posted test was the conceptual understanding test in work and energy there were 6 items with 4 choices. The items were a part of the Multiple-choice Test of Energy and Momentum Concepts developed by Chandralekha Singh and David Rosengrant. The pre-posted score had escalated about 13% (chemistry students) and 25% (engineering students). Furthermore both groups of students also had a positive attitude to teaching and learning physics with PI and Plickers approach.

Keywords Peer Instruction, Plickers, Work and Energy

1. Introduction

1.1. Peer Instruction

During the past 30-40 years, the physics education researchers had devoted mentally and physically to develop the researches for solving the problems related to physics learning management. One of the published researches is the Peer Instruction (PI) management developed by Eric Mazur professor at the Department of Physics and Applied Physics, Harvard University [1]. The PI-based learning management is the active learning management for students to understand scientific concepts with the set of questions called ***ConcepTest*** through peer discussion. PI-based learning management is the highly effective learning management approach based on the learning assessment framework of Hake [2]. This is because there are some researches confirming that from the PI-based learning management in 30 subjects, there are only 3 subjects which are in low gain. The rest are in the medium gain [3]. In addition, PI-based learning management also enhances the interest / attention on learning management of the students as well [4].

1.2. The Interactive Management System between the Instructors and the Learners

Technological advancement enhances the class management during the discussion to be more effective changing from oral answering, hand raising, sign board answering or writing the answers on the paper. It is the classroom response system which can collect data, display results, give feedback, and evaluate learners at the same time [5]. Such system is widely used in leading universities of the world, for example, the University of Edinburgh, Harvard University, etc. PI teaching helps creating the collaboration among the learners in building the knowledge altogether [6]. However, the learning management model applying the classroom response system introduced at earlier stage as the PI learning management is still ineffective [7].

1.3. Clickers

The Clickers set (Figure 1) is the set of equipment developed under the audience response systems [8]. It is the set of equipment quite costly (around 1000 – 1500 USD depending on the brand). 1 set of Clicker contains 32 data storage cartridges for 32 students. Therefore, Clicker is not widely available in Thai educational system. However, due to the quick technological advancement at present, the technology is highly efficient, cost-effective and accessible to all classes, for example, the mobile phones which we call

"smart phone". The educators have developed an interactive management system between instructors and learners on mobile phones called "Plickers" [9].

1.4. Plickers

Plickers is the program for the interaction between the mobile phone with cameras installed with the Plickers application for scanning QR-Code (Figure 2). There are 63 sheets of data and all of the answers will be processed and displayed on the instructor's mobile phone (Figure 3) and via the web browser (Figure 4) at the same time.

Figure 1. Data storage cartridges and atmosphere of learning with Clicker

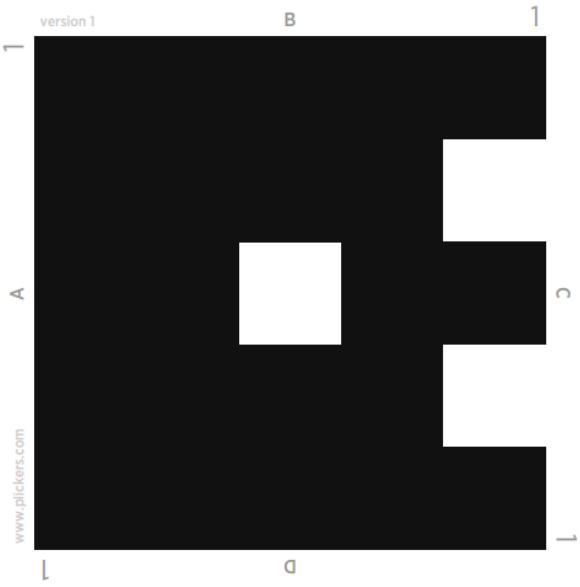

Figure 2. QR-Code sheet to be used with Plickers

Figure 3. Display of answers of the learners on mobile phone

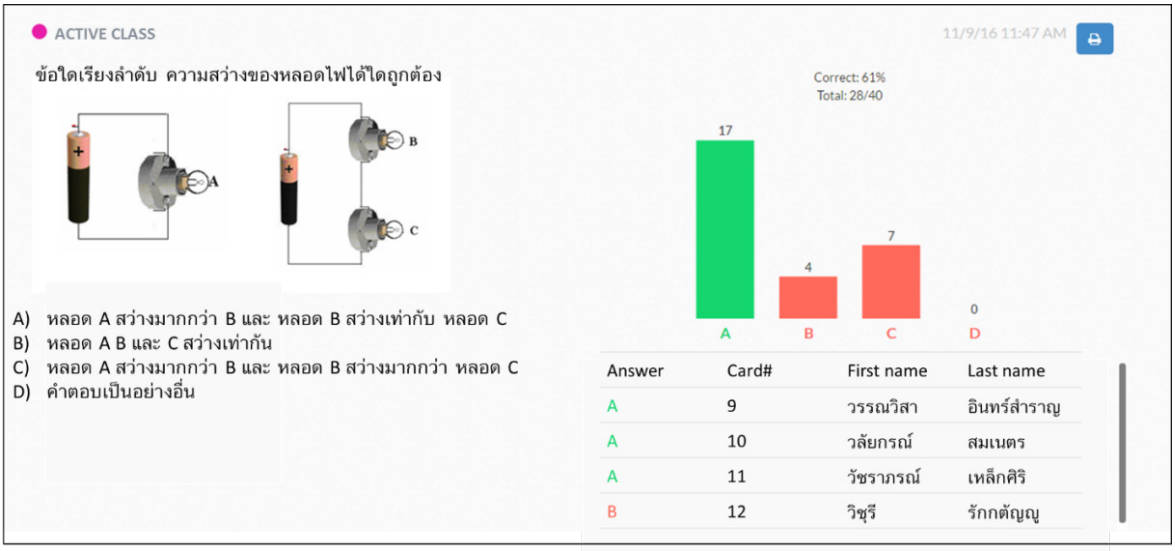

Figure 4. Display of answers of all learners via web browser

2. Understanding the Scientific Concepts about Energy Work

The definitions of energy have many different contextual aspects. For example, in some physics books, it defines the energy as the ability to cause work. This is not entirely correct because according to the second item of thermodynamics law, there is some energy that cannot produce work [10]. Moreover, the energy also appears in the fields of biology, chemistry, astronomy, and geology [11, 12]. Thus, explaining about work and energy requires different contexts.

The energy contains five important characteristics [13] which are:

- *Energy conservation* – In a closed system, energy can neither be created nor destroyed. This is one of several conservation laws used in physics.
- *Energy degradation* – The total amount of useable energy in a system may decrease over time. This may take the form of energy dissipation (energy lost from an open system) or energy transformation within the system to a less useful form. For example, a cup of hot tea will eventually cool. The thermal energy from the tea has been 'lost' to the surrounding environment. It has not been destroyed, but is no longer a part of the cup and tea system.
- *Energy transformation* – The energy can be transformed from one form to another, for example, dropping the ball by in gravitational field of the earth, the potential energy can be transformed to kinetic energy.
- *Energy transfer* – The energy can be transferred between components in a system; in a collision, one billiard ball transfers its kinetic energy to another.
- *Energy source* – The energy can be added to the system. For example, the Earth is the system. The Earth receives energy from the sun which is very needed to compensate for the heat that the Earth loses outside the atmosphere.

Previous researches have shown that learners still have misunderstanding on the concepts of work and energy. For example, the gravitational energy is fictional [14]. The kinetic energy is vector quantity of work because the gravity is based on the distance in the level. The research of Singh and Rosengrant gives the notice that the reason why the learners have misunderstanding on the concepts of work and energy is partly from the meaning of work in everyday life is different from the meaning of work in physics [15].

3. Objective

The researcher found that the PI learning management model has the advantages in the discussions with classmates. If it is used in conjunction with Plickers application that is featured in terms of instant data storage and display, the learners can be developed to have better understanding on the concept of science in that subject or not and what are the attitudes of learners generally towards physics will be. The researcher selects the topic of work and energy which is an important topic for students of all levels and all majors.

4. Methodologies

4.1. Sample

The sample groups for this study were first year students in bachelor degree of chemistry (N = 50) of academic year 2016 and first year students in bachelor degree of engineering (N = 119) of academic year 2017, Ubon Ratchathani University, Thailand who have enrolled in introductory physics course by purposive sampling. Most

chemistry students (98%) did not like physics and though that physics is difficult. The result was from eliciting students wrote their feeling towards physics at the beginning of the class. However, both engineering students and chemistry students did not have much difference in background knowledge of physics.

4.2. Data Collection

The researcher collected data by allowing the students to do six items of pre-test on the work and energy covering three key concepts; work, work due to gravity and laws of energy conservation, and energy. The students were given 10 minutes for doing the test. Afterwards, the instructor handled the PI learning management by using the question called *ConcepTest* as the important tool for discussion among learners before and after the discussion. The instructor asked the students to give the answers, record the answers, then shown answers by using Plickers application. Therefore, the instructor will know the percentage of students answering the question correctly. If the correct answers are less than 50%, the instructor will conduct teaching following the PI learning management process again (as shown in Figure 5). However, the brief presentation will be conducted in different form by using multiple representations such as energy bar graph, images, equations, or etc [16]. If the correct answers are more than 50%, the instructor will summarize such scientific concepts by using student's answers as cases for giving the right explanation. In addition, before and after learning management, the students have responded to the online questionnaire (Google form) about the attitudes towards learning management of introductory physics courses.

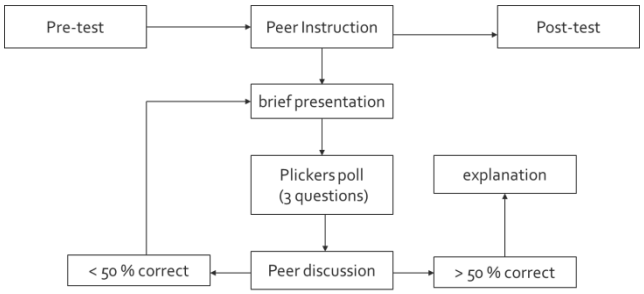

Figure 5. Procedure of data collection

5. Results and Discussion

Understanding the scientific concept of work and energy: From the analysis on the average scores of the entire class, it was found that the scores increase from 31.3% to 46.3% for chemistry students and 28.3% to 53.3% for engineering students. As the result, the scores were lower than 50% and slightly higher than 50% for chemistry students and engineering students. When analyzing by using the methods of Hake [1] to evaluate the learning progress, it was found that the normalized gain equaled to 0.22 (chemistry students) and 0.35 (engineering students) in the full proportion of 1.00 which were considered to be low gain ($g > 0.3$) and the medium gain ($0.3 < g < 0.7$) respectively. The result from chemistry students was different from the research of Chandralekha Singh [16] conducting the PI learning management and finding that learning progress was in the medium gain ($\langle g \rangle = 0.55$). However, engineering students' result in this research was in the medium gain but the gain was still lower than the lecture conducted by Chandralekha Singh. Meanwhile conventional learning management had the learning progress in the low gain ($\langle g \rangle = 0.22$) and the medium gain ($\langle g \rangle = 0.35$). From interviewing both groups of students, they gave the reason that they were not familiar with the kind of understanding questions and they were not confident in answering because in high school, they focused on problem solving (mathematical problem in physics).

When considering the percentage of chemistry students who answered each question correctly in post-test, it was found that there were only three out of six items scored more than 50% (as shown in Figure 6). In Question 1, the scores of students answering correctly reduced after learning, in contrast the number of engineering students who had scored in this question doubled. Question 1 is about the work due to gravity which depends on altitude only. However, the students still had misunderstandings on the high lifting speed and high lifting characteristics causing the different works due to gravity (Figure 8). Although PI-based learning management in this research has not been successful (the learning progress is in the low gain), such learning management still made the students have post-test scores higher than those of the pre-test in the score range from 40-100 percent as shown in Figure 9. On the other hand, engineering students had a better understanding in overall conceptual tests as shown in Figure 7 and 10.

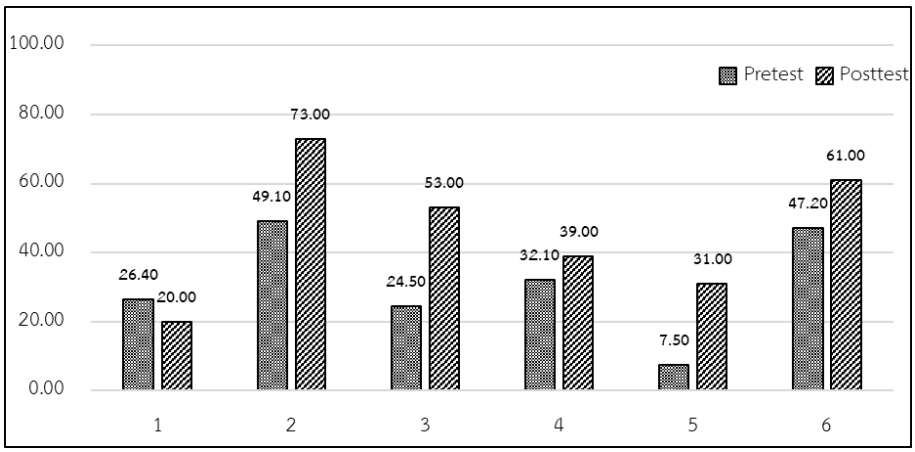

Figure 6. Average scores (percentage) of chemistry students before and after PI-based learning management in each item

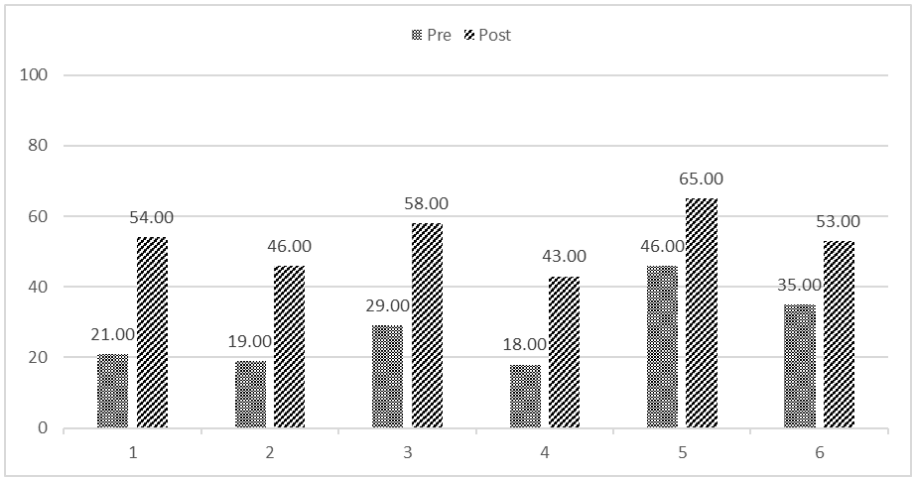

Figure 7. Average scores (percentage) of engineering students before and after PI-based learning management in each item

Question 1 When you lift your luggage from the floor and place it on the table, which one of the followings is correct?

(1) Lifting straight up and carrying it to place on the table cause the different works due to the gravity.
(2) Fast lifting and slow lifting cause different works.
(3) Different heights of tables result in different works.

Choices		Chemistry students		Engineering Students	
		Pre-test (%)	Post-test (%)	Pre-test (%)	Post-test ((%)
a)	(1) only	11.6	40	14.3	8.4
b)	(3) only	26.4	20	21	53.8
c)	(2) and (3) only	15	8	18.5	14.3
d)	(1) and (3) only	47	32	46.2	23.5

Figure 8. Percentage of students choosing the answer in each item before and after the learning management (b is the correct answer)

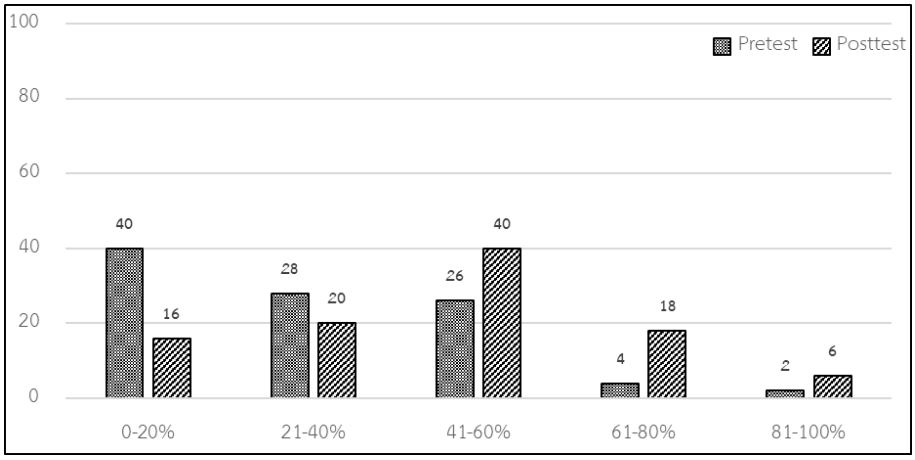

Figure 9. Number of students (percentage) of chemistry students following the score ranges 20 points per range (before and after PI-based learning management)

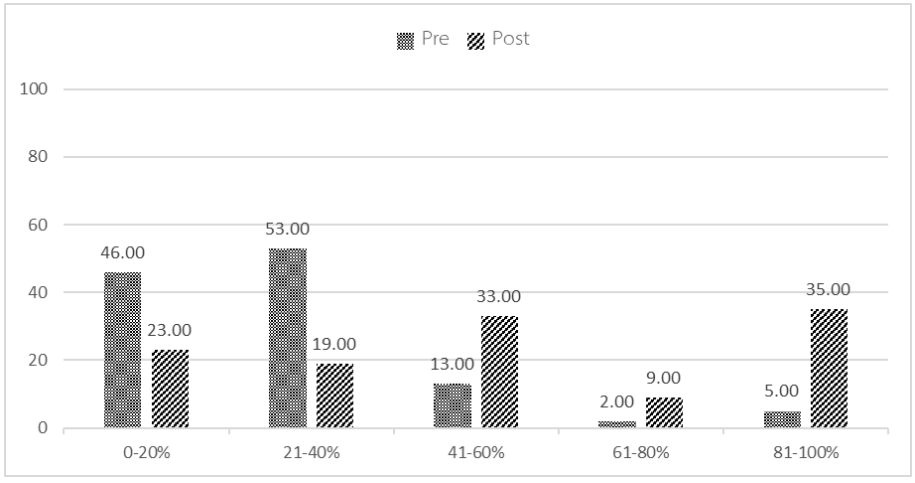

Figure 10. Number of students (percentage) of engineering students following the score ranges 20 points per range (before and after PI-based learning management)

The teacher teaches fun. I like the answering by using technology of the teacher. That the teacher uses mobile phones to scan the answers enjoy us and make us unstressed. We can also evaluate our understanding as well in order to know which answer we choose and why we choose it. The students dare to share the ideas without pressure.
It is changed because the teacher always stimulates us and tries to find the experiments related to the contents for us to try and enjoy. Although we do not totally understand what we study, we want to study because the teacher teaches fun.
Regarding the teaching method, if the students do not understand what they learn, they will become sleepy or the atmosphere in studying will be boring. However, the teaching method of the teacher is fun. The VDO is used to make us see the picture clearly. We can listen to the music in order to be relaxed and have less pressure.
The descriptive teaching styles with examples in the class make us see the picture clearly. Playing the game by using the PLICKERS sheets and the mobile phones to answer the questions on the screen is fun and exciting. It requires both speed and accuracy.

Figure 11. Attitudes of students after the PI learning management

Regarding the attitudes of students before and after learning physics with Plickers in combination with PI learning management before learning management, 98 percent of chemistry students did not like physics and though that physics is difficult. However, after the learning management, the researcher asked the students to write whether their attitudes towards physics have been changed or not and how. Chemistry students were divided into two groups. *Group 1 had not changed their attitudes (13%)*. That was before learning management, they did not like physics and after the learning management, they still did not like physics. *Group 2 had changed their attitudes positively (87%)*. The students said that the Peer Instruction approach, the characteristics of the instructor (good-tempered, fun, kind, no pressure, easily accessible, motivate learners), and technology for learning (Plickers) was the main reasons for the change of attitudes. Samples of texts written by chemistry students were as shown in Figure 11.

From formal interviewing engineering students tended to like physics more. (shift from 73% to 95% after lecturing)

and gave positive feedback. Most of them claimed that they knew that they were not good at physics but they had to work hard on this subject because physics was the essential part in their future career (engineering).

6. Conclusions

From analyzing the average scores of chemistry students' score increased from 31.3 percent to 46.3 percent, the average scores were less than half of the full scores. On the other hand, students from faculty of engineer scored slightly lower than chemistry students which were 28.3 percent but at the end of the class they scored 53.3 percent. Even the number of engineering students (N = 119) were higher than the number of chemistry students (N = 50) but the average score of engineering students was higher that because engineering students concerned about physics more than another group. The researcher found that students in both groups were not familiarized to the conceptual understanding tests according to the secondary education has focused on problem solving in order to compete in higher education. Due to the results of analysis on the learning progress using the method of Hake [1], the normalized gain is 0.22 and 0.35 which is in the low and medium level respectively. However, PI learning management by using Plickers to collect data and display result instantly makes the attitude toward learning management in physics change in the good way up to 87% (chemistry students) and 95% (engineering students).

Acknowledgements

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Determination of Reading Levels of Primary School Students

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Abstract In this study, it was aimed to evaluate the reading performances of 2nd, 3rd and 4th graders. The study was designed in a scanning model. The research was conducted with 2nd, 3rd and 4th grade students studying in Bayburt, Turkey. The appropriate reading rates, reading speeds and reading errors of the students were examined by asking them to read a narrative text appropriate to their class. The texts were selected from the books distributed to the schools by the Ministry of National Education. Error Analysis Inventory was used to diagnose reading difficulties of students and to collect data about their reading performances. It was used to determine the reading levels of the readers individually. The present study is important since it identify students with reading difficulties and determines the necessary programs to overcome these difficulties.

Keywords Reading Difficulties, Reading Errors, Reading Speed

1. Introduction

Reading is described as "the process of deriving meaning through a goal and strategy, based on effective communication between reader and the author, where the reader configures the new information with her current knowledge in a convenient environment. [1]. In literature it is possible to find plenty of definitions about both physical and mental dimensions of reading [2, 3, 4]. Considering these definitions, it is not accurate to limit reading only to word recognition or deprive meaning. It is an active process in which reading, analysis and comprehension are taken place together.

An important element of reading education is reading fluency. It refers to fast, accurate and expressive reading activity. Akyol [5] describes the concept of reading fluency as "reading [a text] as talking to someone by paying attention to the punctuation marks, accent and tonal, abstaining from recurrence and word repetition, without spelling and unnecessary postures and by paying attention to the semantic units." Fluency is the ability to read a text correctly, smoothly and quickly with full expression and good comprehension [6, 7, 8]. Fluency occurs when students can decode text automatically. Students with fluency problems read words with hesitation and often have difficulties in reading certain words. Fluency is important because it ameliorate exhausting and laborious reading activity [9]. *Accuracy* in word recognition refers to the ability to read the text without pronunciation errors; *automatic* refers to being able to read a text correctly and easily, it also refers to good reader skills that can control comprehension during reading cognitive process, and *prosody* refers to reading a text with appropriate expression by reflecting its semantic and syntactic contents and to skills of interpreting it. Fluent reading should be as a natural conversation [10].

Fluent reading is an essential factor for reading comprehension to take place. If a text is read with difficulties and in impassive manner, students experience difficulties when deprive meaning from the text, that is, they establish connections between information in the text and their previous knowledge. The students will also have difficulties in understanding what they read. There are plenty of studies that set forth that students' comprehension skills are adversely affected when they have difficulties in reading fluency [11, 12, 13, 14, 15, 16, 17].

Reading comprehension can be resembled to an umbrella from a broader perspective that includes word recognition, meaning of a word, and its phonetic and structural analysis. When the word recognition skills are not developed, problems arise in comprehension also [19].

Successful reading is a complex interaction of language, sensual perception, memory and motivation. In reading fluency, (1) word recognition and analysis (2) comprehension or structuring of textual understanding are the two important factors. During reading, the reader does not focus her attention on the two processes at the same time because she wants to proceed quickly. However, construction of meaning requires commenting, critical responses, etc. and generally requires attention. The non-fluent reader concentrates her attention to two processes sequentially; and for this reason, she experiences a though

reading which often becomes agitated. Therefore, automatic analysis, an important element of fluency, is significant for reader to achieve high level of success in reading [20]. The development of reading is a process consisting of different stages. Development at each stage depends on learning concepts of the previous stages. Each stage is also a prerequisite for learning. Sub-areas of the reading-learning in the 2005 elementary Turkish instruction program were determined as voice awareness, discovering alphabetical relations (voice-to-letter matching), word recognition, fluent reading and reading comprehension. Reading instruction involves addressing these subfields respectively. In other words, student must have successfully accomplished the sub-areas of reading specified in the program in order to be able to gain reading skills.

Children who cannot read fluently experience concentration problems while reading. They additionally make reading errors such as reverse transitions, skipping (dropping and adding), and repetitions [21]. The mistakes made during the reading prevent students from understanding texts. For this reason, correct recognition of the word is required. Clear, systematic and intensive teaching is crucial for students who cannot read fluently to gain fluent reading and reading comprehension skills.

In order to apply necessary intervention programs for students who do not have fluent reading skills, it is necessary to determine students' reading and comprehension levels. In this case, teachers have important responsibilities.

Analyzing the reading levels will provide important information to us for identifying the factors that affect student's ability to learn reading skills. A comprehensive evaluation about reading performance is so significant; to determine the weaknesses and limitations of students by identifying difficulties of students during reading and to find out the sources of the problem and to assist the parents and teachers in preparing the intervention program (individualized education practices) according to students' needs. Good assessment also plays an important role in providing information about the students' development status [22]. Especially class teachers have a very important role in the first teaching reading and writing phase in the school education. For children to be more successful in their future lives, it is important to assess their reading performance in a vigorous way and to prepare the intervention program accordingly.

In recent years, close monitoring of student performances at different disciplines and class levels across the world, both nationally and internationally, is considered to be significant in assessment of national education policies and programs. Such assessments are crucial in increasing the quality of education and in determining overall trends in success. There is a range of reading assessments that lead to more decisive teaching practices beyond large-scale overall assessments of children's momentary success. However, these tests, which are not used in Turkey, are standardized or informal that can be applied to individuals or groups. These assessments give teachers the opportunity to examine students in depth as readers. The level of achievement of students gives information about their reading difficulties and interests at some extent [23].In Turkey, reading is the most emphasized language skill in the 2005 Turkish Instruction Curriculum. However, many students, considering their class level, are having problems with reading fluently. There are two reasons for this. First: students come to the class unprepared and usually fall behind their classmates. Over time, these students turn out to be poor readers. When the class acquires the general reading skills, teachers speed up to teach new subjects and these students are neglected. The second reason is that the reading processes of poor readers are not addressed in the following grades [24]. For providing an effective teaching it is important to determine and overcome the deficiencies of the students with reading difficulties. This study is also considered to be important in terms of determining reading levels of primary school students and assisting teachers and parents about preparing educational programs.

The main purpose of this research is to investigate reading levels of primary school students (2nd, 3rd and 4th graders). The aim of the research described here answer to the following questions.

1. What are the reading levels of 4th, 3rd and 2nd grade primary schools students?
2. Is there a difference in students' reading levels according to gender?
3. Is there a meaningful difference between students' reading performances (number of errors, number of words per minute, words recognition percentages, and overall duration)?
4. What types of the errors do students make according to their grades?
5. Does the frequency of reading errors of the groups formed according to reading levels differ significantly from each other?

2. Method

2.1. Model of the Research

The research was designed in a scanning model [25], which aims to collect data to determine the specific characteristics of a group. Screening models are research approaches that aim to describe a fact as it was in the past or is in the present [26]. On the basis of this model, independent variables were determined as reading levels based on grades, gender and correct reading rates. And the dependent variables were frequency and reading performances (reading speed, word recognition percentage and reading errors) of the students who had reading problems in specified classrooms.

2.2. Study Group

The study group was consisted of 255 students, whose

mother tongue is Turkish, from the 2nd, 3rd and 4th grades in three primary schools in the central district of Bayburt. The socio-economic statues of the selected schools were at the medium level. Permission was obtained from the necessary institutions and study was carried out on the basis of volunteerism. Reading performance of students was evaluated individually. For each student a sufficient reading time was given.

2.3. Data Collection Tools

In order to collect data on oral reading performances reading texts and the "Error Analysis Inventory" was used. The Error Analysis Inventory used in the study was adapted to Turkish by Akyol [27], using Harris and Spay [28], Ekwall and Shanker [29] and May [30]. This inventory serves to determine the comprehension and individual reading level of readers. In this study, however, it is only aimed to determine the reading level. When the students made oral reading, their word recognition levels were determined, and at the same time, their vocal reading mistakes were identified with details. Three different reading levels are identified through this inventory [5]: Anxiety level (individual makes several reading errors and understands very little from her/his reading), Teaching Level (individual needs support from a teacher or an adult for reading and comprehension), Independent level (individual can read and comprehend the reading materials appropriate to her level without support from a teacher or an adult). In Anxiety Level, one makes a large number of reading mistakes and comprehends very little of what she reads. In Teaching Level, one needs the support of a teacher or an adult to comprehend what she reads and read in a preferred way. In Independent Level, one reads and comprehends the texts appropriate her level, without the need of a teacher or an adult person. Levels of oral reading skills of students: Independent level is 95-100%, Teaching level is 90-94% and Anxiety level is 89% and below [31]. The texts used to determine reading levels of the students' were selected from Turkish textbooks distributed to elementary schools free of charge according to their grade level by the Ministry of National Education.

2.4. Application of Data Collection Tool

In order to determine their reading levels, the students were asked to read orally a Turkish narrative text from the textbooks approved by the Board of Education: "Little Lemon Tree" (consists of 399 words) from 4rd grade textbook for Turkish class, "Anatolia" (consists of 240 words) from 3rd grade textbook for Turkish class and "Little Rockfish" (consists of 177 words) from 3rd grade textbook for Turkish class [32-33-34]. The researcher reported the overall duration after when students were reading the texts. The researcher also marked the places where they misread and corrected themselves on the text and took notes about their reading performances. In addition, the students were recorded by a voice recorder when reading texts.

2.5. Data Analysis

During the application phase, each student read the selected reading text once, and the readings were recorded on the voice recorder. Errors that students made during reading and reading speeds were noted. In order to increase the reliability of the study, the students' readings were listened to again by the researcher and the reading records were decoded and scored according to the Error Analysis Inventory. The data obtained from the Error Analysis Inventory were analyzed with the Statistic Program for Social Sciences (SPSS, version 10.0). The data on the reading levels of the students were presented as frequency and percentage. And the Chi-square test was used to analyze if there is difference between their reading levels according to gender. And the Factor Analysis of Variance (Anavo) Test was analyzed to set forth the difference between students' reading level and reading performance (number of error words, reading speed, word recognition percentages, and reading durations).

Students' oral reading errors were examined in five groups; skipping, adding, repeating, misreading and reversing. The frequency of oral reading mistakes helps researcher to determine the students' level of reading. Moreover, as the frequency of oral reading mistakes increases, the reading level of the student will decrease, which will make reading comprehension insufficient.

The reading speed of the students was evaluated in terms of number of words per minute and reading duration of the whole text. It was predicted that reading speed of the students would be 80 words per minute at the 2nd grader's level, 100 words per minute at the 3rd grader's level and 120 words per minute at 4th grader's level [35].

When the word recognition percentages of the students were calculated, the percentage of correct words read per minute was taken into consideration. This percentage is calculated by dividing the number of correct words into the total words (correct or incorrect read words) [23].

3. Findings

3.1. Findings Related To the First Sub-Problem

The findings related to the first sub-problem "what are the reading levels of 4th, 3rd and 2nd grade primary schools students?" are presented below.

The data on the reading levels of the 4th, 3rd and 2nd grade primary school students are presented in Table 1.

Table 1 shows that reading levels of 105 students (41.18%) out of 255 students were at the independent level, 75 students (29.41%) were at the teaching level and 75 students (29.41%) were at anxiety level. Based on these data and reading levels in terms of the 2nd grades, 34 students out of 76 (44,73%) were at the independent level, 21 students (27,63%) were at

the teaching level and 21 students (% 27, 63) were at the anxiety level. Considering 3rd graders; 31 students (39.24%) out of 79 students were at the independent level, 25 students (31.64%) were at the teaching level and 23 students (29.11%) were at the anxiety level. Considering 4th grade students, 40 students (40%) out of 100 students were at the independent level, 29 students (29%) were teaching level and 31 students (31%) were at the anxiety level.

Table 1. Reading Levels of Students

Grade	Reading Levels			Total
	Independent Level (%95-100)	Teaching Level (%94-90)	Anxiety Level (%89 or below)	
2	34	21	21	76
3	31	25	23	79
4	40	29	31	100
Total	105	75	75	255

3.2. Findings Related To the Second Sub-Problem

The findings related to the second sub-problem "is there a difference in students' reading levels according to gender?" are presented below.

The results of the chi-square test about difference in reading levels of primary school students according to gender are shown in Table 2.

Table 2 shows that 50 students out the 127 female students were at the independent level, 40 students were at the teaching level, 37 students were at the anxiety level and 55 students out of the 128 male students were at the independent level, 35 students were at the teaching level, and 38 students were at the anxiety level. It is found that there was no significant difference between the students' reading levels and gender, x^2 (sd = 2, n=255) = .58, p>.05.

Table 2. Reading levels of students according to gender

Gender	Reading Levels			Total
	Independent Level (%95-100)	Teaching Level (%95-100)	Anxiety Level (%95-100)	
Female	50	40	37	127
Male	55	35	38	128
Total	105	75	75	255

x^2=.58 sd=2 p=.74

3.3. Findings Related to the Third Sub-Problem

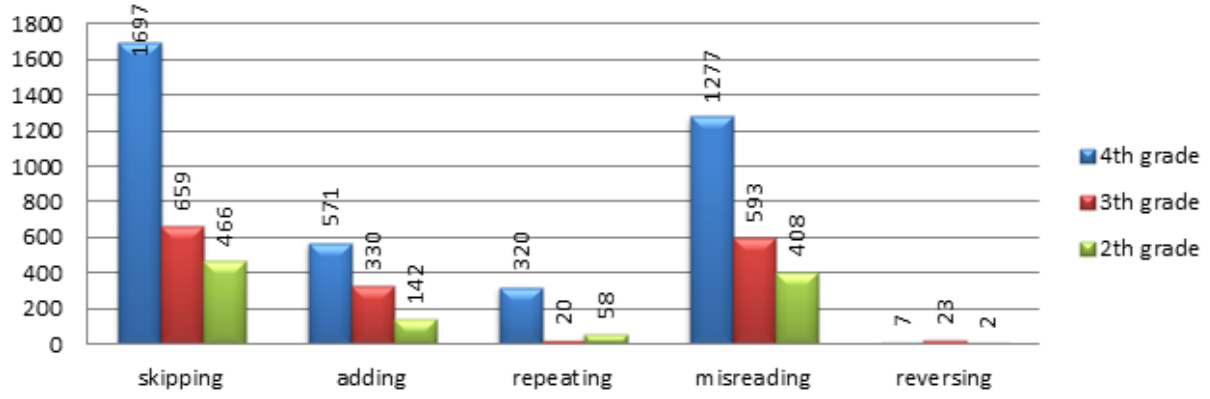
The findings related to the third sub-problem "is there a meaningful difference between students' reading performance (number of errors, number of words per minute, words recognition percentages, and overall duration)?" are presented below.

The results of the ANOVA analysis that examines if there is a meaningful difference between students' reading performance (number of errors, number of words per minute, words recognition percentages, and overall duration) are presented in Table 3.

Table 3 determines that there is a significant difference in students' reading errors and their reading levels. It is seen that there is a significant difference in number of errors in favor of anxiety level, while number of per minute and word recognition percentage in favor of independent level, and overall duration of the reading in favor of the anxiety level.

Table 3. Differences between reading errors per groups

Variance	Group	Average	ss	f	p	Significant Difference
Number of mistakes in the text	Independent	8.75	5.16	113.38	.000	A>I A>T T>I
	Teaching	22.16	8.22			
	Anxiety	52.78	34.46			
Number of words per minute	Independent	82.60	20.78	22.59	.000	I>T I>A T>A
	Teaching	73.66	20.99			
	Anxiety	59.77	25.91			
Word recognition percentage	Independent	96.91	1.32	254.13	.000	I>T I>A T>A
	Teaching	92.14	1.41			
	Anxiety	82.11	7.77			
Overall duration the text is read (min.)	Independent	3.73	86.17	20.11	.000	A>I A>T
	Teaching	4.38	114.83			
	Anxiety	6.42	277.42			



Graph 1. Types of error according to students' grades

Table 4. Frequency of reading errors of the groups formed according to reading levels

Variance	Group	Average	ss	f	p	Significant Difference
Skipping	Independent	3.82	3.30	74.44	.000	A>I A>T T>I
	Teaching	9.65	6.01			
	Anxiety	22.61	17.50			
Adding	Independent	1.84	1.93	41.19	.000	A>I A>T T>I
	Teaching	4.20	2.71			
	Anxiety	7.12	6.11			
Repeating	Independent	0.14	1.18	15.09	.000	A>I A>T
	Teaching	1.14	2.91			
	Anxiety	3.96	7.79			
Misreading	Independent	3.17	2.39	74.20	.000	A>I A>T T>I
	Teaching	7.08	3.77			
	Anxiety	18.85	15.26			
Reversing	Independent	0.04	0.25	3.68	.027	A>I
	Teaching	0.14	0.42			
	Anxiety	0.21	0.55			

3.4. Findings Related To the Fourth Sub-Problem

The findings related to the fourth sub-problem "what types of the errors do students make according to their grades?" is presented below.

The types of errors the students do according to their grades are presented in Graph1.

Graph 1 shows that the most frequent errors, that is, skipping, misreading, adding and repetition, were conducted by the 4th graders. The reversal error is seen to be done more frequently by 3rd graders.

3.5. Findings Related To Fifth Sub-Problem

The findings related to the fifth sub-problem "does the frequency of reading errors of the groups formed according to reading levels differ significantly from each other?" are presented below

The results of Anova statistics that shows if frequency of reading errors of the groups formed according to their reading levels differ significantly from each other are presented in Table 4.

Table 4 articulates that there is a significant difference in frequency of the errors made by students according to reading levels. It is also seen that there is a significant difference in frequency of skipping, adding, repeating, misreading and reversing in favor of the anxiety group.

4. Conclusion, Discussion and Suggestions

In the study it was aimed to reveal the reading levels of primary school students. Considering the reading levels of the students who participated to the study, it is seen that 34 students in 2nd grade, 31 students in 3rd grade and 40 students in 4th grade could read texts appropriate to their levels without support from a teacher or an adult. Similarly, 21 students in 2nd grade, 25 students in 3rd grade and 29

students in 4th grade could read texts at a desired level with support from a teacher or an adult. In addition, 21 students in 2nd grade, 23 students in 3rd grade and 31 students in 4th grade were at the anxiety level and made several reading mistakes.

In general, in terms of the reading levels of 255 students; 105 students (41.18%) were at the independent level, 75 students (29.41%) were at the teaching level and 75 students (29.41%) were at the anxiety level. There is no study in Turkey that shows proportion of students with reading difficulties. However, according to these results it is possible to conclude that 29.41% of 255 students cannot be ignored. Ergül [36], in his study about evaluating 112 students with reading difficulties in terms of reading performance, found that 13% of students were experiencing reading difficulties. Literature shows that about 10% of the school-age children in general are suffering from reading difficulties; nonetheless, some sources have higher rates [37]. Considering these findings, the results of the present research is very striking.

One of the results of the research is that there is no difference in reading levels of primary school students according to their gender. Nass [38] in his study on gender differences in learning stated that male students experience more learning difficulties compared to female students. Sandu et al. in their study named "gender differences in grey-white article structure of normal reading and dyslexic adolescents" determined that the rate of males experiencing reading difficulties is higher than females [39]. Flannery et al. [40], Rutter et al. [41] found that reading difficulty in males was seen more frequently than females. These studies show that the rate of reading difficulty according to gender is not a consequence. In their study named "dyslexia gender ratio and cognitive profiles" Jimenez et al concluded that the rate of reading difficulties of students did not differ according to the gender. The study also articulated that gender was not a decisive criterion for reading difficulties [42]. Bingöl [43] also found that there was no significant difference in reading difficulties according to gender in his research on primary and secondary school students in Ankara. The results of these studies support the conclusion of the present research.

It was also found that the errors made by the students were significantly different according to the reading levels. It is observed that the students in anxiety level made more errors than the students at the teaching and independent levels. Similarly, their number of words per minute and word recognition percentages was lower and duration of the reading of a text was longer compared to the students at the teaching and independent levels. The studies conducted on reading difficulties have parallel results with the present research regarding to the students with low reading levels [44,45,46,36]. Because students with reading difficulties do not have enough word recognition skills, they spend more time for word analysis. For this reason, students with reading difficulties read slower and make more mistakes compared to normal readers [47,48]. When students' reading speeds are evaluated according to the criteria specified by Güneş [35], it appears that students at anxiety level read more slowly than they supposed to read according to their class level. Students with sufficient reading skills are more likely to have better word recognition skills and reading speed than students with reading difficulties. This result of the present study has parallels with the research conducted by Gökçe Sarıpınar and Erden [49].

Considering the types of errors that students make from rarely to most frequently, it is seen that they make skipping, misreading, adding, repeating and reversing. These errors, except reversing, were mostly done by the 4th graders. Yılmaz [50] in his research named "effects of word repeat technique on developing fluent reading skills" which was conducted with 5th, 6th, 7th and 8th grade students found that the most frequent mistake made by all of these graders was the skipping. Dündar and Akyol [51] determined that the types of mistakes made by student with reading difficulties were misreading, skipping, adding, and reversing, respectively. Gökçe Sarıpınar and Erden [49] identified mistakes as skipping (skipping letter, syllable, line, etc.), misreading, as well as making up the end of the word, and following by finger. In the study conducted with third graders, Yılmaz [50] also found that students made mistakes such as skipping, adding, reading, and reversing. The oral reading errors in these studies have parallels with the mistakes done by the students in the present research.

In line with these results, students who are at risk of having reading difficulties should be identified. And, with necessary educational programs and interventions students with reading difficulties should be supported to overcome reading problems and their academic failures rooted that problem should be recovered. For children, who are our futures, to be better educated, their reading performances should be determined nationwide and an action plan should be prepared accordingly.

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Comparative Study of Sport Mental Toughness between Soccer Officials

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Abstract Gucciardi et al. (2009) [1] suggest that mental toughness is more a function of environment than domains, and as such, mental toughness is potentially important in any environment that requires performance setting, challenges, and adversities. Due to vital importance of mental toughness in sports and particularly in soccer, this paper focused on the comparison of sport mental toughness levels of soccer officials with their age group, education level, refereeing category and sports experience years. Mental toughness was checked by Sports Mental Toughness Questionnaire (SMTQ). The SMTQ was applied to soccer officials (159 licensed referees) who all were registered to the Turkish Football Federation (TFF). The sample consisted of 146 male subjects, mean age was 29.10 years (SD = 7.54, range = 19–54) and 13 female subjects mean age was 22.82 years (SD = 4.71, range = 19–27). To determine the difference of Sport Mental Toughness level among soccer referees One-Way ANOVA was used for normal distribution and Scheffé Test was used for determining the differences across groups with through SPSS Package 21.0 and the significant level was set at 0.05. The findings of this research paper showed that there were significant differences between soccer officials' three sub-factors (confidence – constancy - control) of mental toughness and their officiating experience years. This could be attributed to the fact that 15 and above years experienced officials were mentally tougher than those with 0-5 years' experience and those with 6-10 years' experience. There were not any significant differences between other variables (refereeing categories, education levels and age groups) of soccer officials and their mental toughness levels.

Keywords Sport Psychology, Mental Toughness, Soccer, Officials (Referees)

1. Introduction

Soccer is one of the most popular sports worldwide and a lot of research has been conducted on various aspects of this sport. One of the unique aspects of soccer is that people play many roles. Presumably, a coach, player, and referee from the soccer have a common knowledge base (e.g. declarative knowledge about the aims and general performance within that sport), but are often required to perform different tasks within the context of this sport [2]. Coaches, players and referees try to reach a comprehensive understanding of parameters related to successful athletic performance [3]. However, most of the sport psychology research has focused to examine mostly athletes' psychological performance excellence and other contexts are neglected. Officials are crucial in the soccer, because without them, it would be impossible to develop of the competition of soccer [4]. Therefore, officials' psychological performance should also be considered as an area of further exploration.

Officiating requires knowledge, experience, competence, good personality, optimum performance, and concentration. Also it requires quick and accurate response which means officials often have to make decisions under intense time pressure that may have a substantial impact on the outcome of a game. Officiating activity can be influenced by a number of essential characteristics such as: a good knowledge of the rules, a good physical form and an adequate position in the field of play in each [5], as well as adequate visual and auditory acuity [6]. However, such characteristics are not enough to achieve a complete performance. In fact, psychological variables also play a key role in reaching the expected refereeing performance [7].

Based on the above, it is considered a priority to evaluate the different psychological variables that significantly affect the officials' performance. Psychological variables help officials activate their energy to achieve maximum performance [8]. When examining psychological variables and their effects on performance important to consider mental toughness as one of the variables. The most commonly used definition for mental toughness was developed by Jones, Hanton, and Connaughton (2002) [9]. Mental toughness is, "having the natural or developed

psychological edge that enables you to generally, cope better than your opponents with the many demands (competition, training, lifestyle) that sport places on a performer. Specifically, being more consistent and better than opponents in remaining determined, focused, confident, and in control under pressure" (p. 213).

Furthermore, Gucciardi and colleagues have studied mental toughness in soccer - which is the core sport discipline of the present study - and subsequently presented a construct definition of mental toughness [10]:

Mental toughness is the presence of some or the entire collection of experientially developed and inherent values, attitudes, emotions, cognitions, and behaviors that influence the way in which an individual approaches, responds to, and appraises both negatively and positively construed pressures, challenges, and adversities to consistently achieve his or her goals (p. 715).

In a collective manner, it seems that although there are common attributes of mental toughness for a variety of sports and/or specific contexts (e.g. elite athletes, runners, hockey players, soccer players, coaches, soccer referees), there are also specific attributes to each sport and the respective roles played [7, 11, 12, 13, 14]. For example, Slack et al., (2012) have studied referees to understand mental toughness in soccer officiating. For this aim, they have made interviews with 15 elite referees to understand features that supported excellent refereeing. In their study they found a group of mental toughness attributes relating to characteristics of excellent refereeing which include; (a) coping with pressure (e.g. looking calm and composed / awareness from own emotions), (b) robust self-belief (e.g. confidence own and others' abilities), (c) tough attitude (e.g. focus on performance goals, consistent preparation), (d) high work-ethic (working hard to give 100 percent in every game), (e) resilience (e.g. focus on decisions), (f) sport intelligence (e.g. having a position in a game, a feeling for the game), and (g) achieving striving (e.g. take a lesson from game – fighting for excellent refereeing) [7]. It is noteworthy that findings from Slack et al.'s (2012) study have been similar with other studies' findings aiming to reveal attributes of mental toughness [15]. Those findings – mental toughness attributes – are also considered to be specific attributes for excellent soccer officiating.

As explained previously, most of the studies highlighting the importance of mental toughness were focused on and conducted with athletes. This focus, however, has caused a number of flaws in those studies. For example, since those studies mainly focused on athletes but there are other contexts involved in soccer (i.e. other responsible people and officials), many studies neglected the fact that mental toughness can be important and necessary for those stakeholders as well. In the light of information presented so far and due to vital importance of mental toughness in sports, the present study focuses on the comparison of mental toughness between different category soccer referees.

2. Methodology

2.1. Participants

The participants were 159 athletes who regularly refereed a soccer game during the 2017 – 2018 soccer season in Turkey. A questionnaire was applied to those 159 soccer officials all of whom were registered to the Turkish Football Federation (TFF). The sample consisted of 146 male subjects, mean age was 29.10 years (SD = 7.54, range = 19–54) and 13 female subjects mean age was 22.82 years (SD = 4.71, range = 19–27).

Participants' soccer officiating was maintained at different levels: 81 (51%) refereed at District level, 32 (20%) at the Classification Assistant level and 46 (29%) at C Classification Assistant Referee level. The responding officials had on the average been active as soccer officials at different durations: 52 (33%) between 0-5 years, 48 (30%) between 6-10 years, 36 (23%) between 11-15 years and 23 (15%) 16 years and above. All participants were fully informed about the aims of the study, the procedures, and gave their voluntary consent before participation.

2.2. Measuring Instruments

2.2.1. Sport Mental Toughness Questionnaire (SMTQ: Sheard et al., 2009)

The Sport Mental Toughness Questionnaire (SMTQ) is a 14-item questionnaire established to ascertain athletes' mental toughness levels. The SMTQ is an instrument that measures three dimensions of mental toughness: confidence ($\alpha = .80$, 6 items), constancy ($\alpha = .74$, 4 items), and control ($\alpha = .71$, 4 items). Participants rated items on a four point Likert scale anchored by not true at all and very true. Higher composite subscale scores reflect higher levels of each dimension and higher scores a single composite score reflects higher global mental toughness [16].

2.3. Data Analysis

All statistical analyses were calculated by SPSS 21.0 statistical package. Tests for normality were performed on the data with the Shapiro-Wilk test. All data were normally distributed. Data were presented as quantitative data and expressed as the mean ± standard deviation (SD). Demographic data were expressed using descriptive statistics. One way Anova was used to test differences in total mental toughness across categories of soccer officials.

3. Results

In this section, both descriptive and inferential statistics results are presented. One hundred fifty nine soccer officials completed the survey. The majority of participants were male 146 (92%); there were 13 female (8%). There were 49

participants (30%) between 19 and 24 years of age; 74 (47%) participants between 25 and 34 years of age; 31 (20%) participants between 35 and 44 years of age and 5 (3%) participants between 45 and 54 years of age. 51 % of the participants reported that they worked as a district level referee; 20 % of them worked as a classification assistant referee and 29% of them worked as a C classification assistant referee. The majority of participants graduated from university (76.1%), 17% of them graduated from post-graduate education and only 7% of them graduated from high school. The last independent variable of the study was refereeing experience years of the participants. Most of them had 0-5 year experience in their job with 52 participants (33%), 48 participants (30%) reported they had 6-10 year experience, 36 participants reported they had 11-15 year experience, and 23 of them reported they had 15 – above year experience within soccer officiating. A one-way anova was conducted to compare the effect of age groups of soccer officials on their levels of mental toughness (Table 1). Mental toughness levels were calculated with its sub-dimensions' averages and its total average. It was found that there was no statistically significant difference across age groups of soccer officials participating in the study ($p > .05$).

In Table 2, one-way anova was applied to investigate effect of different categories of soccer officials who participated in the research are significantly different according to the mental toughness variable. It was found that there was no statistically significant difference between categories of soccer officials and their total mental toughness levels and its sub-dimensions ($p > .05$).

Table 1. A One-way ANOVA results between age groups and mental toughness levels.

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Mental Toughness	Between Groups	.58	3	.19	1.03	.38
	Within Groups	28.88	155	.19		
	Total	29.46	158			
Confidence	Between Groups	1.12	3	.37	.64	.59
	Within Groups	89.94	155	.58		
	Total	91.05	158			
Constancy	Between Groups	1.02	3	.34	1.53	.21
	Within Groups	34.48	155	.22		
	Total	35.50	158			
Control	Between Groups	.87	3	.29	.44	.73
	Within Groups	102.70	155	.66		
	Total	103.57	158			

Table 2. A One-way ANOVA results between categories of officials and their mental toughness levels.

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Mental Toughness	Between Groups	.26	2	.13	.70	.50
	Within Groups	29.19	156	.18		
	Total	29.46	158			
Confidence	Between Groups	.67	2	.33	.57	.56
	Within Groups	90.39	156	.58		
	Total	91.05	158			
Constancy	Between Groups	.63	2	.32	1.41	.25
	Within Groups	34.87	156	.22		
	Total	35.50	158			
Control	Between Groups	1.52	2	.76	1.16	.32
	Within Groups	102.05	156	.65		
	Total	103.57	158			

Table 3. A One-way ANOVA results between education level and mental toughness levels.

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Mental Toughness	Between Groups	.01	2	.01	.036	.97
	Within Groups	29.44	156	.19		
	Total	29.46	158			
Confidence	Between Groups	1.35	2	.68	1.17	.31
	Within Groups	89.70	156	.58		
	Total	91.05	158			
Constancy	Between Groups	.18	2	.09	.39	.68
	Within Groups	35.32	156	.23		
	Total	35.50	158			
Control	Between Groups	.88	2	.44	.67	.51
	Within Groups	102.69	156	.66		
	Total	103.57	158			

Table 4. A One-way ANOVA results between sports experience years and mental toughness levels.

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Mental Toughness	Between Groups	4.479	3	1.49	5.96	.00
	Within Groups	37.977	155	.25		
	Total	29.456	158			
Confidence	Between Groups	6.51	3	2.17	3.98	.01
	Within Groups	84.55	155	.55		
	Total	91.05	158			
Constancy	Between Groups	1.84	3	.62	2.83	.04
	Within Groups	33.66	155	.22		
	Total	35.50	158			
Control	Between Groups	1.39	3	.46	.70	.55
	Within Groups	102.18	155	.66		
	Total	103.57	158			

A one-way anova was conducted to compare the effect of education level of soccer officials on their levels of mental toughness (Table 3). It was found that there was no statistically significant difference between education levels of soccer officials participating in the study and their mental toughness levels and its sub-dimensions ($p > .05$).

A one-way anova was used to compare the effect of officiating experience years (working years as a referee) of participants are significantly different according to the mental toughness (Table 4). It was found that –with the exception of the control sub-dimension- there was statistically significant difference between the sports experience years of referees and their mental toughness level and sub-dimensions (confidence and constancy) ($p < .05$).

Scheffe test was used to determine which group had the significant difference. According to the results of the study, it can be noted that 15 years and above soccer officials scored significantly higher than officials with both 0-5 years and 6-10 years. However, they did not score significantly higher than officials with 11-15 years of experience in terms of total mental toughness scores and confidence and constancy scores. In other words, Scheffé post hoc comparisons showed that 15 years and above officials had higher scores than both 0-5 years and 6-10 years soccer officials for averages of total score of mental toughness, confidence and constancy.

4. Discussion

In modern sports, mental toughness is a broadly used expression. It is a factor, which differentiates the effective officials from the ineffective ones. Sports referees with mental toughness have the ability to improve their excellence

to the top level at crucial moments in a field. Scientists started considering soccer referees as performers in their working areas especially in recent years. The sport excellence of elite referees depends on the benefit of using the psychological abilities along with physical abilities [17]. The influence of psychological factors on officiating performance have enlarged nowadays, to such a degree that the officials point out that sports excellence cannot be ensured by only raw physical abilities or features. Effective usage of psychological skills allows officials to mobilize their energy for maximum performance [18].

Previous research focused on officials' sources of stress, models of excellence, stress-related experiences and coping. However, the mental toughness level of officials did not receive enough scientific attention. The present study, therefore, intended to investigate the effect of age, education level, experience years and different categories on soccer officials' mental toughness levels. In fact, it has been observed that there is not enough scientific attention for overall mental toughness phenomenon but there are few studies on components (confidence – constancy - control) of mental toughness in sport psychology.

The present study examined the relationships between officials' overall mental toughness-and its' components- and other variables such as education level, age, refereeing category and sports experience years.

Education levels of officials did not show any significant difference with components of mental toughness and overall. Partial findings show that differences of age categories of officials do not influence their mental toughness. Those results are inconsistent with the study conducted by Nicholls et al. (2009) [19]. In their study it was found that increasing age was shown to predict higher scores in total mental toughness and its components. Moreover, Folkessen et al. (2002) [20] tried to examine effects of age categories on soccer referees' concentration and motivation levels, which are accepted as an attributor of the mental toughness. One possible explanation for this situation may have been that the younger referees have fewer amounts of matches to officiate than the older ones. In contrast with these, there are support our findings. For example, Nazarudin et al. (2009) [21] found no significant differences in mental toughness (psychological preparation) across age levels among rugby referees. The study that was conducted by Anderson (2000) also found that there were not significant differences between age and psychological skills, especially in terms of self-efficacy [22].

Third criterion variable was categories of officials (District level referee; Classification assistant referee and C classification assistant referee). The findings show that there were no significant differences between officiating categories and mental toughness level and its components. In contrast with this; Diotaiuti et al., (2017) studied on self-efficacy skill that accepted as an attributor of the mental toughness. There were 350 active licensed officials of national and regional level. The findings of that research revealed that the national first-level referees have a level of self-efficacy significantly higher than that of the regional referees [23]. Moreover, Giske, Haugen & Johansen, (2016) aimed to examine different category soccer officials' levels about mental preparation to the matches. As they found, elite officials report significantly greater use of mental training compared with sub-elite referees [24]. The results can be speculated as upper category officials may get through the fact that the effects of mental development are not immediate and instead require patience and persistence.

Last criterion variable was years of sports experience years of soccer officials. There were four groups as 0-5 years, 6-10 years, 11-15 years and 15 years and above. Our results showed significant differences between 15 years - above group and 0-5 years / 6-10 years on overall mental toughness, confidence and constancy components. There were not found any significant differences for the control component. Also according to results, there was no significant difference between 11-15 years group and 15 years – above group, whose results that are consistent with the study conducted by Nazarudin et al. (2009) especially for confidence component of mental toughness. In their study, they found significant difference in the component of mental toughness (confidence). 15 years and above group's experience surpassed the all groups that were classified as 11 to 15 years' experience, 6 to 10 years' experience and 1 to 5 years' experience [25].

Similarly our finding that years of experience is effective on mental toughness levels and its' components support Connaughton et al.'s findings [26]. Connaughton et al. (2008) announced that experienced sports officials have higher mental toughness level than less experienced ones. In their study, they concluded that in the development of mental toughness experts should educate referees in their careers from initial periods rather than beginning when they achieve elite status.

In previous studies, it has been found that more experienced referees reported less negative scores within psychological skills (anxiety, stress, choking etc.) and higher positive scores within psychological skills (self-efficacy, confidence, motivation etc.) [18, 19, 20, 27, 28].

There were no significant differences between 15 years and above group and 11-15 years of sports experience group on mental toughness levels. This result can be speculated as there is not too many years of difference between the two groups. This means their experiences about officiating soccer matches are similar.

5. Conclusion

Consequently, sport officials have a challenging job, they need to engaged in many different situations, including evaluating and judging the positions that take place during the match, making fast decisions, managing the game, paying attention to multiple aspects of the game, keeping

order, and solving disputes [29]. Moreover, mental toughness as mentioned above can be defined as "an unshakeable perseverance and conviction towards some goal despite pressure or adversity (p.94)" [30]. In the light of this information, the findings of this study have increased our understanding about the mental toughness levels of soccer officials.

The main limitations of the present study include the gender composition of the sample (mainly male) and the fact that the comparing gender difference related with mental toughness level may add valuable information. Moreover, we only considered the perceptions of the soccer referees' mental toughness level comparison with some variables. Future research can also be conducted including an intervention-education programme about mental toughness to see difference by the time. Because some of the officials were not to be aware of their thoughts or behaviors were directly related with their mental toughness level. After that, the benefits of mental toughness within their career may become more visible and valid in their mind. In spite of these limitations, the present research offers preliminary support and information to guide future studies based on pure mental toughness phenomenon and its effects on officials.

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Action Research of the Multiple Intelligence (MI), Cooperative Learning, and Game-based Teaching into Summer Intensive English Classes for Mixed-level and Mixed-age Students

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Abstract This study is based on the '2014 the Schweitzer Program' in Taiwan which spanned for four weeks from the 2nd to 29th of August. The lessons included four classes of multimedia picture books and eight game-based lessons. The aim of this research is to describe how to integrate the theory of 'Multiple Intelligence (MI)' by Howard Gardner as well as the theories of 'Cooperative Learning', and 'Game-Based Teaching' into summer intensive English classes among mixed-level and mixed-age students. There were 20 participants composed of 13 fifth graders and seven sixth graders with equal members of each gender. The study followed a qualitative action research methodology with the use of interviews, documents and observations. The students had two 60-minute English lessons and one 60-minute multimedia picture book session per week for four weeks with the researcher. This study provided a prototype of lesson plan designs for a group of mixed-level and mixed-age students. Results show that merging games into the teaching content and using 'Game-based Teaching' is significantly suitable for the mixed group. Based on the results, recommendations were provided for both EFL teachers and EFL schools. During lesson plan design, teachers could merge various games into their lessons especially when intended for students of mixed levels. For the schools, it is best to choose teaching materials that combine text with plenty of activities and classroom games.

Keywords Action Research, Multiple Intelligence, Game-based Learning, Cooperative Learning, Multimedia Picture Book, English, EFL, Authentic Materials

1. Introduction

In Taiwan, it is common practice for public elementary schools to group numerous students into the same class and thus, encompassing a wide range of proficiency levels. This increased the severity of the current learning situation as teachers have to manage the huge gap among its students. This phenomenon has persisted for years and has seemingly gotten worse [3]. In most English classrooms, there are students trained with "bilingual" instruction since kindergarten and on the other hand, are students who are just novice to English. Chang [3] discussed the main reasons that cause this big-gap phenomenon and among them are: (1) location of the schools in urban vs. rural areas, (2) varying socio-economic background of the parents and their degrees of concern, (3) amount of learning resources, (4) values and virtues of the teachers, and (5) students' motivation and interests. Therefore, it would be difficult to find same-level students together in a class. Teachers are constantly confronted with the challenge of how to teach a class with mixed-level students and manage the differences in proficiency level.

Teachers should be aware that the diversity of students' English abilities and Multiple Intelligence (MI) could be used as a framework to design appropriate classroom activities. Gardner [10] proposed the concept of Multiple Intelligences (MI), which includes bodily-kinesthetic, verbal/linguistic, logical/mathematical, musical/rhythmic, interpersonal/social, intrapersonal/introspective, visual/spatial, and naturalist. To illustrate, linguistic intelligence refers to the ability to use words to explain complex meanings effectively. Interpersonal/social intelligence is the ability to communicate, interact, and understand others. Visual/spatial intelligence pertains to the

ability to perceive visual information accurately and to recreate images. Instead of conceptualizing intelligence as inherited and unitary, Gardner considered MI as eight distinct intelligences that may develop throughout a lifetime. Liu and Chen [17] pointed out that teachers should help students practice English in the classroom while enhancing their MI through activities using picture books, songs, vocabulary, drama, and games. Thus, multimedia picture books, songs and games were streamlined into the children's curriculum. Brown [2 p103] also supported that "Children need to have all five senses stimulated. Your activities should strive to go well beyond the visual and auditory modes that we feel are usually sufficient for a classroom." Play/Game-Based Teaching model has such trait of going beyond the visual and auditory modes. Teachers can use this effectively by designing games according to the characteristics of the children [15].

Thus, this research applied the "Game-Based Teaching" model proposed by Pivec in 2007 [22]. Due to the diversity in years of English learning and age of the participants in this study, the researcher had to create a comfortable learning environment. This reduces their anxiety and increases their interest. Sandford, Ulicsak, Facer, and Rudd [23] indicated that majority of teachers believed games would motivate students' learning. "Game-Based Teaching" would be helpful for those students who have low learning motivations. However, "Teachers need to consider which games to use, when to use them, how to link them up with the syllabus, textbook or program and how, more specifically, different games will benefit students in different ways."[13] Lin [16] concluded that a successful language game must contain a clear rule, the goal must be well instructed and the game should be fun. The method of Game-Based Teaching motivates children within an atmosphere of enthusiasm, provides opportunities for child-directed instruction, and supports learning with their peers.

Brown [2 p53] defined Cooperative Learning as "students work together in pairs or groups, and they share information and come to each other's aids." It is suggested that when dividing students to do activities, heterogeneous grouping should be used to balance the performance in each group. The study integrates the theories of Multiple Intelligences (MI), Game-Based Teaching and Cooperative Learning to design a curriculum wherein it encourages students to participate in this program and reduces the pressure of learning. This self-designed curriculum targets groups of students with different levels and aims to deliver significant achievement in a specific classroom.

2. Method

Research Design

With a qualitative research methodology, this study carried out an action research composed of observations and participant interviews – also referred to as the general approach of fieldwork [4]. Denscombe defined that the purpose of an action research is "to solve a particular problem and to produce guidelines for best practice". [5] The action research of this study was to find out whether teachers merged the concepts of MI, Game-Based and Cooperative Learning into their teaching and it was hypothesized that this may be considered as best practice for a group of mixed-level and mixed-age students.

The Framework of Action Research

In 2010, DeWalt and DeWalt [6] believed that the practice of observing participants provided two main advantages. It does not only enhance the quality of the data obtained, but also the quality of interpretation during fieldwork. Therefore, this research used the Detailed Action Research model (see figure 1) as the framework. First, diagnosing: identifying the serious bipolar phenomenon in elementary schools. Second, action planning: integrating the concepts of Multiple Intelligence (MI), Cooperative Learning and Game-Based Teaching into self-designed lessons. Third, taking action: conducting the treatment on summer intensive English classes. Fourth, evaluating: collecting the reflection, interviews, and observations from the students and the teacher. Fifth, identifying the findings: concluding the results.

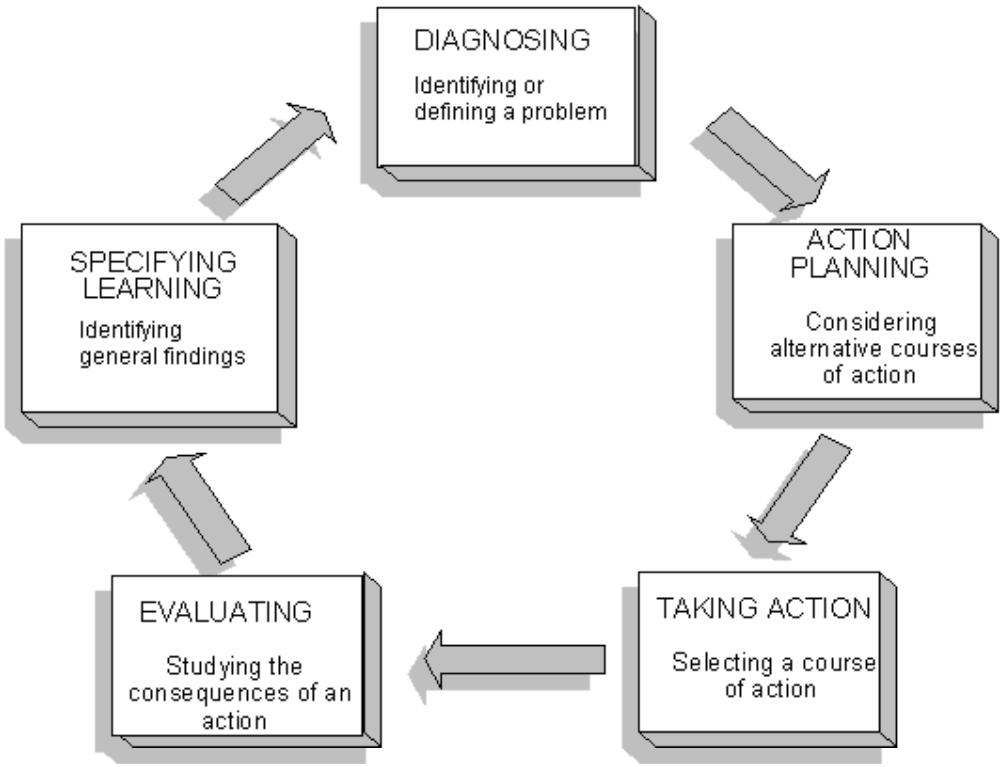


Figure 1. Detailed Action Research Model (adapted from Gerald [25])

Participants

There were 20 participants in this research, composed of 13 fifth graders and seven sixth graders with equal members of each gender. Out of the sample, only two sixth graders attended cram schools for extra English learning while the rest had the regular Elementary classes. In addition, four of them had difficulty in writing English words, and 10 of them showed little or no confidence in their English abilities. These 14 students appeared anxious during the first lesson when they knew they had to write their English names on cards. Half of the participants did not know how to spell them.

Teaching Procedures

The Ministry of Education (MOE) started to promote the program of "Students of the University of Schweitzer spiritual teacher education service plan" in all universities. The main purpose of the Schweitzer Program is to provide a chance in Schweitzer spirit. We need to make sure this kind of spirit lasts for pre-service teachers and allow them to teach low-achievement students during summer vacation in a remote and rural public primary school. Most of the students were from either single-parent households or low-income families. This research incorporates the objectives of MOE and is based on "2014 the Schweitzer Program" from August 2nd to 29th with the purpose of encouraging and counseling vulnerable, low-achievement children to improve their English abilities in school. The aim of this research is to know the process and impact of implementing the integration of Multiple Intelligence (MI), Cooperative Learning, and Game-Based Teaching into summer intensive English classes among mixed-level and mixed-age students.

It was challenging to find teaching materials to fit a variety of proficiency levels while facing a budget constraint. It comprised of eight different lessons and the main text was in the form of self-designed PowerPoint presentations, all based on Multiple Intelligence (MI), Cooperative Learning, and Game-Based structures and concepts. It lasted for four weeks, and the lessons included four classes of using multimedia picture books and eight Game-Based lessons. The procedure consisted of a four-phase instructional sequence: roll calls, songs, introductions, and games or activities (see Appendix A). The topics and teaching plans of the lessons are all listed in Appendix B.

Instrument

Lesson Plans

Ara [1] reported that children could learn better through fun activities since it takes out the formality of learning a language. Moreover, using songs, rhymes and games can be very effective learning tools that appeal to young learners. Over the 4-week experimental study for Multiple Intelligence, Cooperative Learning and Game-Based lessons, the students had two 60-minute English lessons and one 60-minute multimedia picture books session per week with the researcher. The total instructional learning period

compassed 4 weeks with a total of 12 hours. The lesson plans are also provided (see Appendices) as a reference for EFL teachers to design lessons for mixed-level groups and mixed-age students in class.

Self-designed PowerPoint Presentations

The topics were carefully selected according to the competency indicators of elementary students.

Songs

There were a total of eight different songs selected according to the topics (See Appendix B).

Games

Games such as "Bingo", "Guessing Games", "Easy Equations" and "Go Fishing" were used to supplement lessons.

Art & Crafts

Each class included 30 minutes of storytelling and another 30 minutes for art and crafts activities, which can attract students with visual and bodily-kinesthetic intelligence. For example, after reading the picture book of *The Crocodile and the Dentist*, students made a giant crocodile replica using a big poster. This way, students were able to use body motions to generate energy and concentration. This activity linked the authentic material and the reading content together by using two senses of learning. Students were good at building things, liked to stay active with their motor skills and were very aware of their bodies. They learn best through movement and experimentation [21, 18].

Multimedia Picture books

Six multimedia picture books were carefully selected as follows: Henny-Penny, The Crocodile and the Dentist, We Are Not Going on a Bear Hunt, Brown Bear, The Very Hungry Caterpillar, and What Do You See. Unlike the paperback picture books, the words on multimedia picture books are easily readable. For instance, after reading the multimedia picture book "*The Crocodile and the Dentist*" together, participants acted out the story, learned the word "crocodile" and altogether made a giant crocodile replica with a poster. They then had the word that matched with the image of the crocodile. Moreover, both Mayer [19] and Fotos [8] concluded that multimedia help build up a long-term memory (see Figure 2).

In summary, the challenges of teaching mixed-ability and mixed-age classes can be difficult. Figure 3 shows the simplified process of self-design lessons for educators to use when handling a mixed group. It is suggested that using multimedia picture books is a preferable and economical strategy. Another crucial reason was that there was a limited budget for the program; thus, it was not possible to purchase 20 hard copies of each picture book for every student. When designing a curriculum with a limited budget, multimedia picture books would be a good teaching resource. The framework of lesson designs is flexible and easy to follow, such as games, songs, art & crafts that are all based on the MI concepts for teaching students with different learning styles. Teachers are free to choose one or two activities and incorporate them into self-design lessons. It is not necessary to follow the exact prototype proposed in this study. This research demonstrated some practical and effective ideas on how to make English classes fun and interesting for young learners.

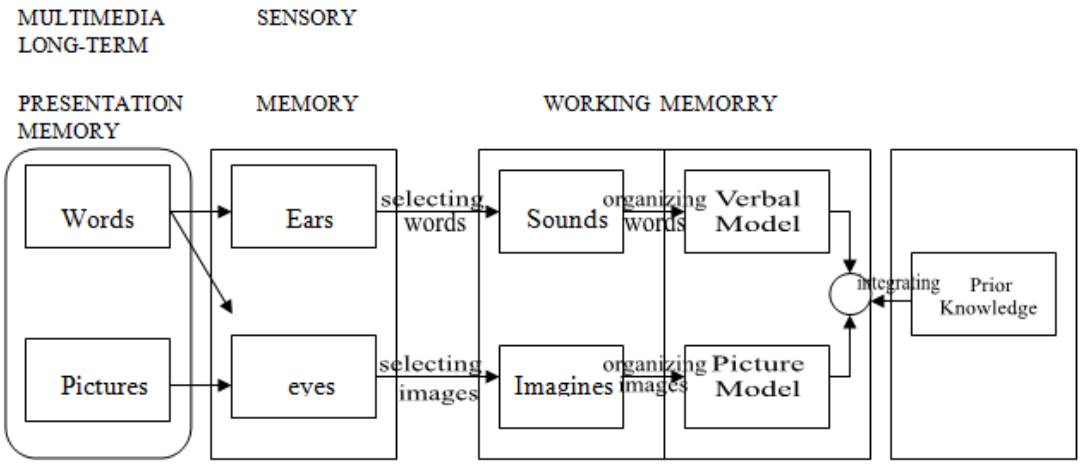
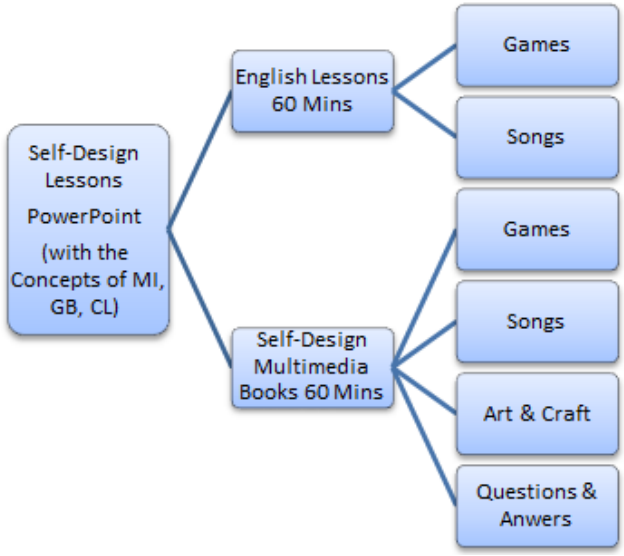


Figure 2. Cognitive theory of multimedia learning. Adapted from "The Cambridge handbook of multimedia learning. Cambridge University Press" by [19]



Note. MI=Multiple Intelligence; GB=Game-Based Learning; CL-Collaborative Learning

Figure 3. Chart of design of lessons

Validity and Reliability

Qualitative research uses a naturalistic approach that seeks to understand the phenomena in context-specific settings, such as "real world setting [where] the researcher does not attempt to manipulate the phenomenon of interest".[20] Patton[20] supported the necessity of the researcher's involvement and immersion into the research wherein before and after events should be properly recorded and presented. The researcher's background consists of teaching experience in both cram schools and elementary schools for a period covering more than 10 years. Together with the research immersion, it was evident that teaching methods must vary to match the students' different needs accordingly. The curriculum needed a thorough change based on the needs and interests of the students, and must include a right amount of useful and fun activities such as singing songs, rhymes and playing games. Pulling from personal teaching experience, it was made clear and certain that students felt more relaxed in a classroom when they did not receive any pressure on learning English.

The type of research that produced findings arrived from real-world settings where the "phenomenon of interest unfold naturally" [20]. To provide constructive feedback and strengthen the reliability of this study, this research was carefully examined by Dr. Su, a professor who has been active on the academic field for 20 years. Her feedback is information-specific, issue-focused, and based on empirical evidence. This included, but not limited to, the identification of strengths/weaknesses and areas for improvement, correction, positive or negative reinforcement to students' behaviors, and forensic diagnosis on the lesson designs of this program.

Teacher's Observations and Reflections

"Every cognitive act involves an agent who carries out an action or set of actions in some task or domain".[11 p40] Students' actions in class can potentially be evaluated by someone competent such as a teacher in that particular task and domain space. Teachers can examine students' cognitive powers, traits, and temperamental disposition based on bio-psychological perspective. Teachers should check the activities are carried out within societal discipline. Finally, a knowledgeable teacher should provide an evaluation and judgment of these actions [11].

The teacher observed all activities that the students were involved in for a period of 27 days. The researcher took field notes and recorded the reflections on the students' apparent engagement, activities, reactions, and participation. The students were also interviewed individually once during the study. Semi-structured interviews (see Appendix C) were used to ask questions based on class observations. The study set out to know how to integrate MI, Cooperative Learning, and Game-Based teaching into summer intensive English classes among mixed-level and mixed-age students. First, the researcher proposed to simplify all teaching materials and segmented the teaching process for mixed-levels of students. For instance, when teaching the sentence patterns in Lesson Four "What's This?", the teacher made sure to maintain the main sentence pattern until everyone became familiar with it and understood its usage. Subsequently, teachers may also include "What's That?" into their lesson plans.

For the students in class, they could not identify when to use "this" and "that". It is highly recommended to stay in the same topic until all of the students are familiar with the usage of one sentence pattern. Second, set different goals for different levels of students. When asking a question to students of different levels, teachers should establish different sets of expectations. For high-achievement students, the researcher encouraged them to answer the questions by going deeper into detail. This allowed them to take their learning to a higher level. As for the low-achievement and underprivileged students, the goal was to let them understand and respond to questions with words instead of sentences. Third, aside from giving group rewards, the teacher is recommended to also give individual rewards as they serve different purposes. Group rewards are to encourage low-achievement students while personal rewards are to motivate high-achievement students.

In regular classrooms, students with relatively lower abilities are usually silent or distracted during class. However, all students in this program showed positive responses. They were more willing to provide answers in class. It is suggested to apply a method of heterogeneous grouping when teaching mixed-level students. The findings also indicated that the low-achievement students showed less anxiety and seemed to show more interest toward the lessons. The result incorporated with Hooper and Hannafin [12 p1] concluded that "The mixed ability treatment substantially improved the achievement of the low ability students without an accompanying significant reduction in the achievement of the high ability students."

3. Results and Discussion

During the one-hour lesson with game activities, the researcher found out that students paid more attention to the lessons. The use of teaching materials appeared to be effective with students at all achievement levels. Furthermore, they were more enthusiastic in answering questions during class even for low-achievement students. For example, the Bingo game was introduced to increase students' participation by creating excitement. They would not feel tired from studying new words in the classroom and therefore, speak freely using the target language in single words, phrases, or sentences. Li and Zhang [14] indicated that communication activities such as language games, role-playing, and storytelling could be used in an English classroom at elementary level. In addition, there was a positive effect on the achievement and attitudes of students in mixed-age classrooms especially on their attitude toward school, themselves, and others [24].

The findings showed that because games were incorporated into the lessons, students often offered to play games repeatedly. It can be concluded that students had higher interest and increased learning motivation when learning English. When students were confronted with new activities, they paid full attention to the lessons and were very willing to cooperate with their teammates. Collaborative learning is "learning from collaboration", because they perform some activities which trigger some learning mechanisms (induction, deduction, compilation). Peers perform some activities that trigger specific learning mechanisms. This includes the activities/mechanisms performed individually, since individual cognition is not suppressed in peer interaction. The interaction among subjects generates extra activities (explanation, disagreement, mutual regulation,...) which trigger extra cognitive mechanisms (knowledge elicitation, internalization, reduced cognitive load, ...) [7].

Collaborative learning is not a method because of the low predictability of specific types of interactions. Basically, collaborative learning takes the form of instructions to subjects (e.g. "You have to work together"), a physical setting (e.g. "Team mates work on the same table") and other institutional constraints (e.g. "Each group member will receive the mark given to the group project"). Hence, the 'collaborative' situation is a kind of social contract, either among the peers or between the peers and the teacher (then it is a didactic contract). This contract specifies conditions under which some types of interactions may occur, but there is no guarantee they will occur. For instance, the 'collaboration' contract implicitly implies that both learners contribute to the solution, but this is often not the case. Conversely, reciprocal tutoring could be called 'a method', because subjects follow a scenario in which they have to perform particular types of interaction at particular times [7].

Moreover, students asked to repeat most of the games constantly. Game-Based Learning is often experience-based or exploratory, and therefore relies upon experiential, problem-based or exploratory learning approaches [9]. A well-designed game not only reduces the learning pressure but also helps students learn the target vocabulary or sentence patterns more efficiently. When interviewing students with the following questions:

1. How do you feel when you are in English class?
2. What is your favorite activity?
3. Do you like English class?
4. When you encounter problems, what will you do?
5. Please list sentences you learned in class.

The researcher received the following reflections from students:

- *Songs are my favorite. I love singing and do the movement (s01).*
- *I love Bingo game. It is very exciting (s010).*
- *I like making crocodile with a piece of paper. It is so cool (s03).*
- *I do not have a favorite because I love all of them (s011).*
- *When I had questions about the activities, my leader always explained it to me (s14).*
- *I do not feel anxious like I did in English class (s13).*

The findings above are all positive. When participants were asked a to write the sentences that they had learned during the lessons, all of them could recall at least three sentences patterns even for the low-achievement ones. Nonetheless, for some students, they had difficulties to spell some words, such as this, like…etc.

Surprisingly, the researcher did not encounter any difficulties when teaching a mixed-age group. However, it was the process of preparing teaching materials and selecting suitable multimedia picture books and songs that took most of the time. The results provide that among all the games, the *Bingo* game was the one that participants enjoyed the most. As for one-hour multimedia picture books with art and crafts making, participants loved the part of art & craft making after the story, "the existence of apraxia constitutes one line of evidence for a bodily-kinesthetic intelligence, is an evidence of the cognitive features of body usage" [11] and also students loved the songs. The results are aligned with Pivec [22 p387]" Many of us have grown up playing games, and in primary education games have a high presence in formal and informal segments of our learning." It is critical to take out the pressure within the learning environments to reduce their anxiety and gradually increase their learning interest.

4. Conclusions

The mixed-age classroom was set up because of budget constraints. It was compulsory to combine students of different ages in a single classroom because the district could not afford to hire additional teachers, or because of the declining enrollment rate that often occurred in rural districts. This situation gives rise to negative attitudes as a result of not being prepared and not having the proper academic materials to meet the needs of all students. Courses taught in a mixed

age group is more challenging h problematic than in a regular class of the same age. It requires more perseverance, patience, planning and love for children. When designing the activities/games in class, the concept of Multiple Intelligence (MI), Game-Based, and Cooperative Learning helped to plan suitable lessons to fit all students' learning styles. For example: songs for audio learners, guessing game for visual learners, and equations for mathematical learners. As a whole, it is recommended to assign a more able and more experienced teacher to the mixed-age classroom in order to effectively manage the variety of children's abilities. One of the significant results from this study is that the incorporation of games into teaching or using Game-Based instruction may be an appropriate solution for a group of mixed-level and mixed-age students. Based on the results of the study, EFL teachers are suggested to carefully design a lesson plan that combines games and teaching. When designing teaching materials, it is better to provide a variety of helpful games that are related to the topic. Most importantly, when doing remedial teaching for low proficiency students, results showed that games not only motivated students' learning but also reduced their anxiety. Furthermore, apart from the paperback books, using self-designed PowerPoint presentations had a great positive effect. It does not only answer the budget constraint but also fit the students' abilities accordingly as the teacher can easily rearrange the text.

In Taiwan, a senior student's English ability doesn't guarantee that he/she is better than a younger student. It still depends on how long the student has learned English. Therefore, teaching a group of mixed-age students can be challenging, but there are several ways that you can work with this situation and have an enjoyable and successful time for all of the students involved. The study provided some tips for mixed age classes. First, invite the students' parents to help out. For example, teachers can be specific to let parents know what assistance you will need and what you would like them to do outside of class. Especially, for those younger learners who need more parents' assistance. Second, teachers can ask the older kids to act as mentors or as teacher's assistants. This allows the older kids to have the opportunity to lead younger students and reinforce their learning. Students may be working with different materials, such as art and crafts or worksheets with the mixed group and the teacher won't have as much time to spend helping all the younger students. In this situation, there is a good chance to let the older learners help out the younger children, and generally those younger children will look up to the older students. While playing games like Matching in teams with one older child and one younger child paired together to match picture cards to word cards together, it is a pleasure to see them help one another and teach each other.

Third, encourage everyone to participate in all the activities and use flexible teaching materials. For example, picture books, stories, crafts, and songs are great for kids of a variety of ages. Because of the illustrations, crafts and lyrics are great materials to help attract young learners. By using picture books, crafts, and songs that are simple enough for very young children and entertaining enough for older learners of all levels, all of the students can join in these activities. Fourth, teachers can interact with each of the students by asking them questions and giving them tasks that are appropriate for their levels. For example, if you have students who are readers, have them help you read and answer your questions. The study emphasizes the concepts of MI, Game-Based learning and Collaborative Learning that is important because not only are children working on important collaboration and social/emotional skills, but also they will help build a child's confidence and interest in those learning domains.

The finding showed that the integration games or activities into the curriculum require the experience in selecting suitable games to students of different levels. It is suggested that English teachers should consider the learning of the target languages first, then develop suitable (activities/games) to assist the language learning. Most elementary school teachers were limited by the textbooks and kept traditional ways of not developing games or activities because they thought the latter was a waste of time. In conclusion, teaching experience is a key factor for successful teaching. In the design of teaching activities, the main focus is to allow students to learn the target language. Interesting and fun activities are only incidental and supplementary for assisting their learning. It is important to examine the way in which mixed-age grouping is implemented in a particular class. It is suggested that the mixed-age program must be carefully designed, and teachers who teach in these classrooms are required to be well prepared for the curricular materials and trainings necessary to effectively teach in type of setting. Through time, patience, careful observations, and flexibility of lesson designs, teachers can use these tips to successfully balance how to teach with mixed ages. Future studies can conduct a similar research method but covering a longer period of time to generate a detailed observation report and more thorough analysis.

Appendices

Appendix A

Teaching Procedures

1. Roll call (5minutes).

   Throughout calling their names, to get them know and used to hear each other's names better. The instructor may also give greetings at this period.
2. Song (10 minutes)

   Songs are careful selected to relate to the topics were introduced each time; also design some movements to help students memorize the lyric better.
3. Introduction (15 minutes).

   The instructor presents a new task topic, such as vocabulary or sentence patterns.

4. Games and activities (30 minutes).
   Students are divided into two groups to compete and each group would have to answer or reach the goal that the instructor set for each lesson.

Appendix B

Lesson Plan (Lesson 1 to Lesson 4)	
Lesson 1-8	Teaching Procedure
Lesson 1	
I want to get to know you!!	1. Sing Hello Song: http://www.youtube.com/watch?v=eBF9DxxAfkU 2. Using PowerPoint instead of textbook and print out name cards to give every student. (See appendix A and B) 3. Ask students to write their names on the cards, and write down a basis introduction using the sentence patterns showed on the 3rd slide. 4. Encourage students to come to the stage to read their self-introductions.
Lesson 2	
Phonics Fun	1. Sing ABC Song: https://www.youtube.com/watch?v=j2hazzQ5bSs 2. Introduce the sounds and the letters. 3. Teaching students to combine sounds and pronounce the words. 4. Bingo game (See appendix C).
Lesson 3	
It's a /an _____.	1. Song: It's a/ an _____. http://www.youtube.com/watch?v=tNK0ToOgntw 2. Teaching the target words: box, ox, umbrella, apple, van. And the correct usage of a/ an. 3. List more nouns for students to put a/ an.
Lesson 4	
What's this?	1. Song: What's this? https://www.youtube.com/watch?v=wX9117iMwK0 2. Teaching the target sentence: What's this? And also review the vocabulary taught in Lesson 3. 3. Let students guess the words showed on the slides.
Lesson Plan (lesson 5 to Lesson 8)	
Lesson 1-8	Teaching Procedure
Lesson 5	
Numbers 1-100	1. Song: Number song. https://www.youtube.com/watch?v=e0dJWfQHF8Y 2. Teaching numbers and also plus and minus. 3. Giving each group some easy equations for students to calculate and then say the answers.
Lesson 6	
Do you have ____?	1. Song: https://www.youtube.com/watch?v=mef1gsdSu_I 2. Introduce the sentence pattern "Do you have _____?" And also the rules of the card games 3. 4 students in each group to ask each other the questions by playing cards. The student who gets more pairs of the cards, wins the game.
Lesson 7	
How many _____ are there?	1. Song: https://www.youtube.com/watch?v=G3zaC5onBvM 2. Introduce the sentence paten "How many ____ are there?" and then also review numbers. 3. Practice the sentence by guessing the numbers of the items in my bag.
Lesson 8	
Jump, Jim, Joe	1. Song: Jim, Jim Joe https://www.youtube.com/watch?v=60mVmu3qqvk 2. Introduce the lyrics and also do the movements. 3. Sing the song and dance.

Appendix C

Interview Questions

1. How do you feel when in English class?
2. What is your favorite activity?
3. Do you like English class?
4. When you encounter problems, what do you do?
5. Please list sentences you learned in class.

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The Opinions of the Turkish Teacher Candidates about the Webquest

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Abstract Webquest, first introduced by Dodge in 1995, is a research and inquiry tool that uses the Internet as a resource. The interest of the students regarding the characteristics is included in the related literature according to the researches made. There is a need for studies to be regarded by the teacher candidates for the webquests regarded by the teachers and students. The purpose of this research is to determine the opinions of Turkish teacher candidates who have knowledge about Webquest and have designed the Webquest about the Webquest and the difficulties they faced in Webquest design process. For this purpose, an interpretive basic qualitative research patterns was used in the research. The study group of the research consisted of 46 teacher candidates. The study group is composed of teacher candidates who have knowledge about the Webquest and designed Webquest before the interview. Semi-structured interview form was applied to collect data in the research. In analyzing the data, both content and descriptive analysis techniques were used together. As a result of the research, it has been found that the teacher candidates think that the webquests have many advantages for both students and the teachers, as well as there are some limitations in Webquests, and they have experienced various difficulties in the Webquest designing process, focusing on Internet resources.

Keywords Webquest, Internet, Turkish Teacher Candidate

1. Introduction

In today's world where technology is developing at a great pace, we are surrounded by computers and the Internet. It is possible to see the technology and the innovations introduced by technology in every area of life. Undoubtedly, it is an undeniable fact that the innovation, which is the most expanding area of our day, is the Internet. In everyday life, the Internet has become an indispensable tool for most individuals. Today, we meet the Internet in all areas of our lives. It is possible to reach all kinds of information on the Internet, which has become a large information pool [1]. It is clear that there is a need for reliable resources and methods in this pool of knowledge for students to swim without drowning.

According to Prensky's [2] definition, today's student is "Digital Native"; in other words, born in a digital world, met with technology from very young ages and not suffering from using technology. The teachers who teach these students are "Digital Immigrant"; in other words, met in the later stages of their life with technology and have difficulties in adapting their lives to technology. The closure of this gap between the teachers and students depends on the well-educated teacher candidates and teachers' follow-up on innovations. In today's world where we face computer and the Internet at every moment of our lives, it is unthinkable for the institutions that educate teachers to train individuals away from technology [3]. For this reason, educational institutions and educators attach great importance to the use of Internet, computer and the innovations they bring in teaching environments [4].

The more the number of senses participating in the educational environment increases, the more the success will increase. The computer-aided education by addressing more than one sense of the students provides a multi-media environment that enables students to comprehend the subjects more quickly, to make their knowledge more permanent, and thus to be more successful [5]. The studies are conducted on many systems that allow students to study online and continue their education activities. One of them is Internet supported methods [6].

There are various studies about the usage of internet in education, which is one of the biggest sources of information for learners. The internet-based methods that will increase the interest of today's students, facilitate the researches and make the learning-process more fun lead these studies. One of these methods is the Webquest. The Webquest allows students to use the Internet as a resource and to access the materials related to the subjects they are studying [7-8].

1.1. What is Webquest?

Webquest, an Internet-based teaching method, was introduced by Bernie Dodge of San Diego State University in 1995. Webquest was later developed with the contributions of Tom March, who was also working at the same university, to gain a more educational view.

Web Quests began to be used in 1993 as a form of Internet that began to be used in education and became popular with the discovery of the Mosaic browser [9].

From the date it was started to be used, Web Quests have been continuously examined and tried to be developed in this process. The popular Internet search engine "Google" found 207,000 pages on the "Webquest" term on March 23, 2002 [10]. In 2005, Google found 664,000 pages on the "Webquest" term [11]. Today, this number is 4.020.000. This number is also a sign of the use of Webquest as an effective learning tool over the years.

Dodge [12], the developer of the Web Quests, describes the Webquest as a research-driven or research-based activity designed to optimize the use of time by a student, where students interact with each other and use some or all of the information they receive from the Internet. March [13] describes the Webquest as a reliable learning structure that motivates students in their personal expertise development, research and inquiry activities, links to the necessary resources on the Internet, transforms newly learned information into more detailed learning. Summerville [4] describes Webquest as an alternative approach that teachers have prepared and allow students to navigate and learn on the Internet, while the Kelly [14] describes the Web Quest as a lesson plan to develop the teacher's creativity in the form of an active world-wide-web page with a specific purpose and preselected Internet links for the students. According to Patterson and Pipkin [15], Webquest is an effective way to help students acquire new knowledge as a guide in the learning environment and to organize irregular Internet resources. Given these definitions, it can be said that Webquest is a teaching method that helps students to research and solve the problems, using the Internet as a tool [16].

1.2. Webquest Components

When the literature on the Web Quests designed to mobilize high-order thinking skills is searched, it is generally emphasized that the Web Quests is or should be formed in 6 steps [17-21]. The steps in the Web Quests are as follows:

- Introduction
- Task
- Process
- Resources
- Evaluation
- Conclusion

Dodge [12] has stated that these 6 steps must be absolutely necessary for the effectiveness of the Web Quest and its purpose to be understood. In this section, it is worth mentioning the features and functions of the 6 steps that make up the structure of the Web Quests:

a-) Introduction: This is the first step in the Webquests, where an introduction to the topic is made, a general overview of Webquest is given. The main objective of this section is to provide the necessary background for the Webquest participants, to prepare for the research and inquiry of those who will complete the Webquest, and to motivate them by drawing attention to the topic. In this section, students will be informed about what to expect during the Webquest, and information about the activities and research that students will make in the class. Often the work to be done in this section is presented to learners within an interesting scenario. Therefore, students are informed about the role they will undertake within the scenario in this section. Teachers can produce unlimited ideas and subjects for Web Quests where the imagination of teachers is at the forefront [18]. This section should lead the student to the subject and what to be expected, to raise the interest of the student with different ideas, narratives and methods, to present the situation and to present the preliminary information about the situation [12].

b-) Task: In this step, information is given about what to do with the subject, the tasks and roles that will be given to the learners are introduced. In this step, the learners are given tasks in the Web Quest process. Dodge [12] stated that tasks must be feasible, interesting, motivating, authentic and student-directed. Dodge [22] collects tasks that can be given in Web Quests under 12 titles. These tasks are as follows:

- Retelling Tasks
- Compilation Tasks
- Mystery Tasks
- Journalistic Tasks
- Design Tasks
- Creative Product Tasks
- Consensus Building Tasks
- Persuasion Tasks
- Self-Knowledge Tasks
- Analytical Tasks
- Judgment Tasks
- Scientific Tasks

While Sandars [20] stated that the tasks to be taught to learners may include a problem to be solved, a summary to be written or a series of questions; Fiedler [10] stated that presentations, exhibitions, discussions or games may take place in the assignments. According to Dodge [22], this section is the most important part of the Web Quest and is the part that the students use all their energy and also the designer focuses. Dodge [22] notes that a well-designed process can also be done as the most important features and requires high-level thinking skills.

c-) Process: In this step, learners are presented with a variety of roles or tasks they can perform during the Webquest. When the tasks are fulfilled, it is specified which

steps will be passed and what roles are given to the learners. The duties assigned to the students in this step and the instructions given for the fulfillment of these duties must be clear, understandable, simple and in accordance with the level of the student. One of the most important features of this section is that it helps the students to organize the information they have learned. Therefore, the instructions that will guide the students must be included in this section. In the process part, Yoder [18] stated that teachers often need to guide their students in a step-by-step, often-numbered way, with tasks, managing time, and suggesting more effective ways for students to collect the given roles and data.

d-) Resources: This section consists of the Internet links that are set by the Webquest designer and will be used by students in their research. The resources to be used for Webquest should be carefully identified and the students must be prevented from using the Internet unconsciously. According to Dodge [12], the resources in this section may also include resources outside the Web environment. According to Yoder [18], these sources may be reference books, videos, some places, and people who might be useful. The selected resources in this section should be appropriate for the students' level of readiness and the development of the targeted age group [21].

e-) Evaluation: This section describes how students will evaluate the products they will ultimately put forth at the end of the Webquest. These products can be reports, presentations, demonstrations, and so on. It is possible to use rubrics in the evaluation of students [23] and checklists [21]. The score cards included in the assessment tools and the duties identified in the process step should bear similarities [12].

f-) Conclusion: It is the last step of the Webquests. This is the step where the information and goals that the students will achieve when they complete the Webquest. This step, which is similar to the introductory step, contains information on the achievements that students will make on the basis of the work they do with their work.

1.3. The Purpose of the Research

The purpose of this research is to determine the opinions of Turkish teacher candidates who have knowledge about Webquest and have designed the Webquest about the Webquest and the difficulties they faced in Webquest design process. In order to determine the opinions of teacher candidates for this purpose, the following questions were placed:

1. According to the Turkish teacher candidates, which advantages do the Webquests gain to the students?
2. According to the Turkish teacher candidates, which advantages do the Webquests gain to the teachers?
3. According to the Turkish teacher candidates, which limitations do the Webquests have?
4. Which difficulties do the Turkish teacher candidates face while designing the Webquests?

2. Method

This section consists of research pattern, study group, data collection tools, collection of data and analysis of data.

2.1. Research Pattern

The purpose of the research is to determine the opinions of Turkish teacher candidates regarding the Webquest method. For this purpose, an interpretive basic qualitative research design was used in the research. In this pattern, the researches concern about the way the individuals interpret their lives, structure their worlds and make sense of their experiences [24-26]. Interpretative basic qualitative research focuses on how participants interpret a situation or event. It includes the data interpretation approach that is obtained by many data collection methods such as interview, observation or document review. Participants' views are analyzed in a versatile and descriptive manner. In the basic interpretive qualitative research process, the purpose is to try to understand the participants' experiences, their perceptions of the process, and their own meanings about the experiment with which they are interacting with the world [27]. In this study, 46 Turkish teacher candidates were interviewed and it was tried to determine their opinions about Webquest.

2.2. Study Group

The study group of the research was 46 teacher candidates who were studying in the department of Turkish Education of Ağrı İbrahim Çeçen University in the academic year of 2015-2016 and who took Teaching Technology and Material Design course. The study group is composed of teacher candidates who have learned about Webquest and designed Webquest before the interview.

2.3. Data Collection Tool

Semi-structured interview form was applied to collect data in the research. Semi-structured interview is the type of interview that takes place between the structured interviews and unstructured interviews. For semi-structured interviews, a series of questions is prepared for use in all interviews. The questions are asked in the same order to the interviewees; however, the interviewee is allowed to respond to the questions as he or she wishes during the interview [28].

In order to determine the questions to be included in the interview forms to be used in the research, the literature review was performed first. A draft form was created after the literature review. The form created was presented to obtain the views of the 3 measurement-evaluation specialists, 1 instructional technology specialist and 1 Turkish teaching field specialist and 8 questions in the form were reduced to 4 as a result of the views received. In this way the final semi-structured interview form is obtained.

2.4. Data Collection

The researcher in the basic interpretive qualitative research shows an inductive approach to create the concepts, hypotheses and theories. In the research process, the researcher's purpose is to deeply understand the participant's perception including a phenomenon, a process, a viewpoint, and a world-view [25, 27]. In order to collect data in this research, first of all, information was given to the teacher candidates about the features of Webquest, Webquest, application and design of Webquest within the scope of Instructional Technology and Material Design course. In addition, the teacher candidates are required to design a sample Webquest. Following these procedures, the interview form prepared for Turkish teacher candidates was applied in order to deeply understand and interpret the viewpoint of Webquest and their views.

2.5. Analysis of Data

In analyzing the data, both content and descriptive analysis techniques were used together. In the qualitative researches, four stages are defined as "Creating a Framework to Analyze", "Processing of Data According to Thematic Frameworks", "Identification of Findings" and "Interpretation of Findings" [26]. In this first step, a code list was created taking into account the general characteristics of the conceptual structure and qualitative data, and main themes were tried to be determined so that a framework for the study was drawn. In the second step of the analysis, a detailed reading of the qualitative data was carried out in order to elaborate the frame drawn with the main themes and to determine the sub-theme patterns of each main theme. Significant data were selected for the study in this process and some data considered not to contribute to the study were excluded from the analysis. Thus, sub-themes have been reached that provide the concrete themes. The third step of the analysis included the same quotations that reinforce the main and sub-themes to increase the credibility of the data presented by the participants. In the fourth and final step, the links between the datasets providing the qualitative support of the research have been tried to be provided, compared and interpreted [29].

Within the scope of this study, the results are expressed in a descriptive way and frequently cited directly from the opinions of the teacher candidates. Although the results obtained are not generalizable to the nature of the qualitative research, it is important to contribute to the body of literature, as it will help the teacher candidates to understand the experiences gained within this study. As a result of the detailed evaluation of the data obtained through the interview, three main themes for the advantages, disadvantages, effectiveness and applicability of Webquest in Turkish lessons were determined. The data interpreted according to these themes are included in the findings section.

3. Findings

In this part of the study, the data obtained from the opinions of the teacher candidates were analyzed by applying content analysis and the findings were tabulated together with the frequency values.

3.1. Teacher Candidates' Views on the Advantages for the Students

The advantages of using the Webquest in the teaching environment were asked to the teacher candidates participating in the study and the answers of the teacher candidates were analyzed and expressed in the following table.

Table 1. The views on the advantages of the Webquest for the students

Webquest enables students	f
To use the internet in a safe manner.	24
To learn how to search the internet.	18
To increase their motivations.	15
To attract their attention.	14
To enhance their self-confidence.	12
To develop their visual literacy skills.	11
To help learning at their pace.	10
To participate actively in the courses.	6
To study the subjects as much as they desire.	5
To help learning in a permanent manner.	3
To use high-level learning skills.	1

Looking at Table 1, it is seen that teacher candidates pointed out that students have advantages in many aspects. The vast majority of teacher candidates agree that Webquest enables students to use the Internet in a safe manner. According to teacher candidates, Webquests teach students how to search the Internet and can be used as an educational tool on the Internet. Teacher candidates have stated that Webquest has strengthened the motivation of the students, attracted their attention, developed their visual literacy skills that enhanced their self-confidence, and supported their active participation. The opinions of Participant Teacher (PTC) 12, 22, 29, and 36, which express their views on the subject, are as follows:

"I honestly did not find the Internet very healthy for students. There is a lot of harmful content on the Internet. I thought that it was necessary for students to stay away from the Internet as much as possible, but with Webquest I saw that the Internet could be used for education. With Webquests, students can use the Internet safely. Because the resources they need to use are predetermined. The Internet will be more reliable as the teacher determines the resources that the student will use. "(PTC 12)

"Webquests are easy to use. With a well-prepared scenario, students can learn every subject. Almost all of the resources on the Internet will attract the students' attention. They will

make them more active and they will be able to learn permanently. "(PTC 22)

"Some students may have difficulty attending classes, either due to shyness or fear of not knowing. Here, Webquest is very helpful to students in this situation. Because the Webquest can be used outside of the classroom, the students will use Webquests without hesitation. Thus, they will direct all their attention to the course. In addition, their self-confidence will improve. "(PTC 29)

"Every student cannot learn the same way. Their speeds are different. Webquest allows students to adjust their learning speeds according to their needs. They can repeat what they want, and they do the tasks in the given scenario the way they want. I think it will be permanent. "(PTC 36)

Given the views of teacher candidates on the advantages that Webquests provide to the students, it is understood that teacher candidates think that students can develop in many ways through the Webquest. Teacher candidates have previously ignored the educational use of the Internet, but it is possible to say that Webquest can offer the Internet as an educational tool to the students. Teacher candidates who are thought to be aware of the advantages of Webquests are likely to benefit from Webquest as teachers and will include webquests in their lessons.

3.2. Teacher Candidates' Views on the Advantages for the Teachers

The teacher candidates were asked about the advantages of the Webquests for the students as well as the advantages for the teachers and the obtained data were analyzed and presented in the Table 2.

Table 2. The views on the advantages of the Webquest for the teachers

With the Webquest, the teachers…	f
Can implement and reiterate the subjects	22
Can teach in an entertaining manner	17
Can teach the students how to research	13
Can use the time efficiently	10
Can easily teach the lesson	9
Can track the learning of the students	7
Can reach out to more than one student at the same time	5
Can communicate with the students regardless of the location	3
Can improve the motivation of the students	2

When Table 2 is examined, it is seen that teacher candidates think that the Webquest will help teachers in many ways. For the vast majority of teacher candidates, the teachers can reiterate the subjects and teach the students in an entertaining manner with the Webquests. Besides, according to the teacher candidates, the webquests are the tools that can help the teachers to teach the students how to do research, to use the time efficiently and to easily teach the lesson. As regards this issue, the views of (PTC) 5, 16, 19, 27, 41 are as follows:

"Teachers want students to be prepared for the classes. They want the subjects to be remembered after it is been taught. They give a lot of homework for this. Students often do not do homework or not like to do homework. With Webquest, students can learn by having fun. Because they use something they often use in everyday life. Teachers can also prepare a variety of webquests to prepare students for a subject, or for students to practice after they have discussed a subject. In this case, the students will not be bored that much. (PTC 5)

"The Webquests are being prepared on the Internet and students are using the Webquests with the Internet. Therefore, even if a student does not come to class, he can follow the course without falling behind. In addition, the teacher can follow more than one student at the same time. The teachers can continue the communication with the students outside the classroom. "(PTC 16)

"Teachers want to tell more with less effort. They want to be less tired and to give more information to their students. Although the teacher will be exhausted for scenario design and the steps to find the resources needed for this design on the internet, the teacher can teach the students more information with Webquest. In doing so, they can do research on Internet by their own and teach students how to do research on the Internet. "(PTC 19)

"I think the greatest advantage for teachers is to use time efficiently. Because it is not possible to teach the subjects of the Turkish course within the time frame specified. I do not think Turkish teachers will be able to teach the subject in the school on time. For this, teachers can use Webquests to teach some subjects more quickly to students. With a Webquest where they can prepare a subject that they need to teach in a few hours, they can transfer it to their students in a shorter time, or they can teach it with Webquest outside of the classroom. "(PTC 27)

"Sometimes all subjects of a theme cannot be taught in the class, or after a subject is taught in grammar, there is not enough practice. Students can also learn the subject incompetently. Webquest can facilitate the teaching of the teachers. If they prepare a Webquest to prepare for a subject before moving on to another subject, students can prepare for that subject. Once a subject has been taught, the students will be able to reiterate the subject if they prepare a Webquest for the application. "(PTC 41)

When the teacher candidates' views on the advantages that Webquests provide to teachers are examined, it is understood that the teacher candidates think Webquest can help teachers in their lessons. According to the teacher candidates, it is possible that the teachers may encounter with the students with a high level of readiness or that fully comprehend a subject with the webquests prepared for before or after the lessons. It can be deducted from the views of teacher candidates that the Webquest will help them teach lessons, track the students, efficiently use the time and teach in an entertaining manner.

3.3. Teacher Candidates' Views on the Limitations of the Webquest

The teacher candidates were asked about the advantages of the Webquests for the students and teachers as well as the limitations and the obtained data were analyzed and presented in the Table 3.

Table 3. The views on the limitations of the Webquest

Webquest…	f
Requires to have a computer	**32**
Requires Internet connection	**30**
Requires costs	**27**
Takes time to prepare	**11**
Requires experience	**6**
May cause attention deficit	**3**

When Table 3 is examined, the opinions of teacher candidates about the limitations of Webquest are more on hardware and cost. The need for a computer and internet for the use of Webquests and the need for a cost for them are views shared by the teacher candidates. On this issue, the views of 14, 17, 25, 28, 34 (PTC) are as follows:

"I need a computer to use the Webquest. Given the circumstances of our country and especially the geography we are in, I do not think everyone has a computer. In this case, some of the students may be unable to reach the webquests, which may lead to some problems."(PTC 14)

"Some students may not be able to access the Internet. Therefore, they cannot use the Webquests. Moreover, if the Webquest is not well prepared, students will be distracted and turn towards other content on the Internet. "(PTC 17)

"I think the Webquest requires an experience to prepare. In order to prepare an effective and instructive Webquest, it is necessary to prepare a good scenario and research the Internet resources well. This will also take time. "(PTC 25)

"The students can participate in the webquests in the computer laboratories located in schools, if any. If there is no computer facility in the school and there is no computer and internet access at home, students will have a hard time." (PTC 28)

"Internet and computers for Webquest is a must. Each student's family may not be able to provide them. Perhaps this problem can be solved by purchasing computer to the school for the use of each student. But ultimately they require cost." (PTC 34)

3.4. Teacher Candidates' Views on the Difficulties Encountered While Preparing the Webquest

Teacher candidates have prepared Webquest before their views were taken on Webquest. In the study, the teacher candidates were asked about the difficulties they encountered or they may encounter in the Webquest preparation process, and the data obtained from the teacher candidates were analyzed and presented in Table 4.

Table 4. The views on the difficulties encountered while preparing the Webquest

For the Webquest…	f
There are not enough resources on the Internet.	**35**
It is difficult to reach some resources.	**27**
Some resources are not reliable.	**22**
Some resources are not appropriate for the levels of the students.	**18**
There is not much Turkish content.	**15**
It is not easy to prepare scenario.	**6**
It is necessary to have experience.	**3**
It is necessary to know how to use the computer.	**2**

When Table 3 is examined, it is seen that the teacher candidates complain about the fact that they do not have enough resources on the Internet. Teacher candidates stated that they generally had difficulties with resources when preparing webquests. The lack of resources, the difficulties in reaching the sources, the reliability of the resources, the appropriateness to the student level and the limited Turkish content are difficulties. The views of (PTC) 3, 8, 11, 24, 33 on this issue are as follows:

"I realized that there were not enough resources on the Webquest subject we wanted to prepare on the Internet. What I find is almost the same as each other. The sources were copied, and it was not even clear which one was the first source. That's why I had difficulty. "(PTC 3)

"The content on the Internet is the same. There are too many copy-and-pastes. There are also content that is not appropriate for students' levels. I had to do a lot of research for this. "(PTC 8)

"Some of the resources are not reliable. The reason for this is that the source is unknown or the content is not up to date. In this case it was necessary to search the resources well and that took quite a while. "(PTC 11)

"I wanted to look at sample webquests and scenarios on the Internet. I see that the Turkish Webquest was very few. The scenarios of Turkish webquests could not be reached. Webquest is either not opened or it is removed from the site. I have not been able to access some resources about the subject that I have prepared the Webquest. The contents were either missing or removed. "(PTC 24)

"I'm not good at using a computer. I have a hard time for it. It is not easy to search the Internet or find useful resources, but in the process of preparing the Webquest I have to say that I have learned it a bit. I think I will gain experience in time and prepare effective webquests." (PTC 33)

4. Discussion and Result

As a result of this research, in which the opinions of Turkish teacher candidates about the Webquest are determined, it is concluded that the idea that the Internet can be used as a learning tool is adapted by the teacher candidates. According to teacher candidates, the Webquests can teach

students how to search the Internet. The students who participated in a study by Hassanien [16] for the of the effectiveness of the Webquests on the learning of the higher education students and the productivity of the Webquest as a CBL (Computer Based Learning) tool also expressed similar views. They found that Webquest positively contributes to learning experiences and that they are satisfied with their learning experiences, and that they can learn from the Internet.

The constructivism approach, which is the leading approach in today's educational programs, supports that students should be active, live different learning experiences and use various methods-techniques and tools for instructional purposes. According to the constructivist approach, when learners encounter new information, it creates new structures for defining and explaining the world. New information is compared with previously obtained information, re-interpreted and new information is generated. With this new information becoming harmonized, problems are solved [30]. Webquests are the tools appropriate for the spirit of the constructivist approach. Webquests that students can actively perform individually or as a group can mediate the transfer of knowledge beyond the student's memorization of a subject. In a study by Leahy & Twomey [31] of 365 third-grade students of the faculty of education, it is the Webquests' success in telling students that they have had constructivist learning experience for the first time, even though they have taken 2.5 years of lessons on constructivism. Likewise, Zheng et al. [32] ranked students as important constructors of problem solving, social interaction, and supportive learning in the study of the critical factors for Web Quest.

In the study, Webquest has increased students' motivation, self-confidence, and attention. In the study of Zencirci and Asker [29], it has been determined that Webquests contribute to students in both affective and cognitive aspects. The study by Halat [33] showed similar results, and most of the teacher candidates reported that Webquest could be used for teaching purposes, and that Webquests would contribute cognitively, discovering new things in computer and internet use. Effective Webquests require good searches of Internet resources. In this regard, Webquest designers have well analyzed the resources on the Internet and must have reached student-level content.

Webquests also offer several advantages for teachers in terms of features they have. The first of these is to be able to perform the teaching in a shorter time and to be able to practice about teaching. When the opinions of Turkish teacher candidates are generally evaluated, it can be said that Webquests will provide many advantages for the teachers to the teaching environment. Students report positive feedback on the use of Webquests by placing traditional teaching methods and textbooks on the edge, and suggest that teachers should be encouraged to work with Webquest [34]. Therefore, teachers can use Webquest to enrich their teaching, and to keep track of and keep in touch with students during off-school times.

Webquests have some limitations as well as the advantages they have. Halat [35] defines these limitations as follows:

- Preparation is difficult and time consuming.
- It is difficult to apply in places where there is no computer access and internet access.
- Application is very difficult in rural areas.
- The lack of adequate Turkish Web sites at primary education level, difficulties in finding, evaluating and selecting reliable resources make it difficult to apply Webquest in primary education.

In this research, the teacher candidates have suggested similar views, emphasized the necessity of having a computer and internet access for the use of Webquest. Teacher candidates who pointed out the cost of having a computer and internet access in terms of both learners and schools pointed out that it takes time to prepare webquests as Halat [33] pointed out. In this respect it is clear that the preparation of Webquest requires an experience. Teachers will need this experiment both in the design process and in the process of creating a scenario. The first one of these experiences is having enough knowledge about internet resources. Because of the poor selection of the resources used in Webquest, students may be directed to illegal sources. This places a great deal of responsibility on the teachers.

One aspect of the research focuses on the challenges faced by teacher candidates in the Webquest design process. The difficulties faced by the teacher candidates are mostly related to Internet resources such as not being able to find sufficient Turkish content while preparing the Webquest or sites appropriate for the levels of the students as in the research of Halat [33]. For this reason, the teacher candidates had difficulty in their first experience. The Internet contains a wide range of information. It can be very difficult to determine which is the correct one in this stack of information. While teachers are learning the tricks of Internet research while preparing Webquest, they are introducing accurate and reliable resources to the students.

It is possible to say that webquests are an effective tool for instructional environments in line with the teachers' opinions presented in this research. Given the advantages for both teachers and students, Webquest can be used for instructional purposes as it comes along. Of course, the biggest task for this falls to the teachers, and they should introduce the well-prepared webquests to the students.

In order to overcome the limitations of webquests, some improvements can be made both at the level of teachers, at the level of the institutions that educate teachers and at the level of the institutions that the teachers work. First of all, teachers should be trained to be more efficient in terms of the software. Teachers that operate should be trained in preparing electronic content. The Ministry of National Education and the Council of Higher Education should give a lecture on preparing and managing electronic content for teacher candidates in the faculties of education by setting a

joint program [36]. In addition, the Ministry of National Education (MONE) should organize courses or seminars for teachers to prepare and use Webquests in in-service training activities [1, 37].

In the development of students' association skills, it will be positive for teachers to organize the content of the activities they place in instructional environments and the way in which learning environments can relate. In this respect, it is suggested to increase the number of trainings on how to organize learning environments in order to increase the skills of associations in teacher training programs [38].

During the WebQuest application, it is important that the teacher closely monitor the problem-solving process and provide feedback when necessary. In addition, the results of WebQuest activities should be discussed within the classroom to enable students to share their ideas with one another. In this way, students will have the opportunity to test their own ideas so that they will have the opportunity to improve their current ideas and make up their inadequacies, if any [39]. Webquests offers a variety of facilities to teachers. These are as follows;

- ✓ presenting a different evaluation model
- ✓ showing how much and at which level the student can use the given knowledge
- ✓ providing opportunities for students to evaluate the skills of using the technology
- ✓ developing their personal skills and abilities [33].

For the effective use of Webquests, computer-assisted Turkish laboratories can be established outside the traditional classroom environment and lessons can be given in these laboratories when necessary. In this way, it is possible to use both the lectures and the after-class activities in the Webquest environment so that the students can understand and comprehend the different aspects of the subject in a more specific way, critically evaluate it and reinforce the learning [40]. Also, when designing the Webquest event, learners should pay attention to the duration of the material use and the classroom variables. Also, it is important to take into consideration the level of computer literacy and the length of time students spend at the computer [41].

Internet resources have great importance for the use of Webquests. The collaborative environments can be created in the school regarding access to and use of these resources among the teachers. Especially since Webquests have many competencies, cooperation is necessary. The field teacher, computer teacher and the foreign language teacher as there is a requirement to refer to the foreign resources due to the lack of domestic resources may be directed to cooperate in the development of the Webquest activities, and the WebQuest pages produced can establish the database of the school. In order to overcome the shortcomings of domestic Internet resources, resources that are constructed from library resources can be placed on the Internet to be used in WebQuests [29].

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The Challenges of Teaching EFL Listening in Iraqi (Kurdistan Region) Universities

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Abstract The article is dedicated to the issue of teaching EFL listening in Kurdistan region of Iraq. The important role of listening skills in a FL learning is presented, and the difficulties of listening are analyzed, including language (vocabulary, grammar) and psychological (low motivation and self-confidence as well as a high level of listening anxiety) factors. The article involves a questionnaire survey with participation of 98 students from 8 universities in Kurdistan Region of Iraq and 28 teachers from 7 universities in the same region (universities mostly overlap, so totally 9 universities are involved). The survey shows that the level of listening anxiety among the students is quite high.

Keywords Listening Anxiety, Listening in L1, Second Language and Foreign Language, Pygmalion Effect, Motivation, Academic Performance

1. Literature review: Listening in L1, Foreign Language and Second Language

Listening plays a very important role in verbal communication. Rankin indicated that [29] among the four basic verbal communication skills (reading, writing, speaking and listening), most time is dedicated to listening: adult people spend 42 to 60% of their time on listening (babies spend 100% of their time on verbal communication listening, then step by step the percentage of speaking time increases, and only after kids go to school, the percentage of reading and writing increases). That shows the primary role of listening skills, which we use most of our time to communicate at school, at home and during free time, for instance, new generation spends more time watching movies, videos, news, lessons on the internet, and so on.

Purdy stated that [28] listening skills are the most significant competence skills for contacting other people. Listening is the first language skill developed in a baby. Even before being born the baby listens to mother's voice and can distinguish it among other voices. Babies who cannot yet speak recognize the pitch and perceive the emotions of the utterance, they try to distinguish familiar sound combinations in what they hear [34].

No oral communication can occur without listening. Not only do we listen to the interlocutor(s), but also do we listen to / monitor ourselves while speaking, to make some corrections, if necessary. One-sided speaking cannot occur if the speaker is sane: a speaker needs a listener, at least a remote one (listening on the telephone or radio), otherwise the act of speaking becomes meaningless (except, probably, a rehearsal held without listeners).

On the other hand, one-sided listening does occur, and often enough – listening to teacher's explanation or the lecture, to all sorts of recordings, while watching a movie, a TV program, a theatrical performance, etc.

A good speaker needs to be able to listen well and to have the metacognitive strategies for listening. In monologue speaking, the speaker has to preview the audience, their level of education, their background knowledge, to provide comprehensible for them input. In a dialogue, the speaker has to understand the interlocutor, to respond adequately. In a dialogue, trying to speak, unless listening comprehension has been achieved, may cause serious communication problems. Students whose listening comprehension skills are on a low level will experience high anxiety while speaking, afraid of saying something out of place. This, in turn, will lead to forgetting the words they know well, of turning to mother-tongue structures and internal translation, instead of speaking directly in the target language. "It leads to impairment in the ability to improvise in an unstructured and/or new situation. This results in stereotyped, habitual, and familiar approaches that may be maladaptive in the situation." [13, p.11].

While mastering the mother tongue, children spend hours daily on listening. Children not spoken to or, at least, not submitted to technical equipment transmitting human speech (telephone, radio, television, computer, or a record-player) cannot learn the native language. By the time when they go to school, children, like flying aces, have hundreds of hours'

listening experience. Listening is also what they do best: while speaking they may have problems pronouncing certain phonemes, their sentences may be short, primitive and often ungrammatical, and their productive vocabulary is not too rich. However, while listening, they understand well more complex sentences than they can produce and discriminate the correct pronunciation from the incorrect one. Brown [28, p.33] brings an interesting example is his book. A little girl who said her name was "Litha", when the adult cooed her answer "Litha?" said "No, Litha", after which he guessed that her name was Liza.

So, naturally, listening to the mother tongue is normally not purposefully taught to school children. Listening comprehension in the native language for people is as natural as breathing (except those, who have listening impairment or mental problems). However, some schoolchildren better understand teacher's stories and explanations, while others may not understand deeply and correctly enough. The reason for that is that the listener normally makes some forecast of what s/he is going to hear, that is why comprehension is sometimes wrong, based on false expectations [25]. In language art classes school children practice writing a summary of a story listened to, note-taking and then retelling based on the notes made and answering comprehension questions. This is, however, rather done for concentration of attention and the development of writing, speaking, summarizing and other cognitive skills. In reality some attention in these activities is paid to listening skills and strategies, too. In the mother tongue listening does not normally cause anxiety, except people who have trait anxiety and tend to be anxious too often. The lack of listening skills, caused mostly by the lack of training in second and especially foreign language causes not only a deficiency in these skills, but also anxiety in listening situations, due to the lack of self-confidence.

When children have problems of listening comprehension in the native tongue, it is usually parents who explain them the meaning (and children are normally not shy or afraid to ask to repeat or explain the utterance), and with time they develop (more often subconscious) strategies of listening comprehension. It is also interesting that either children or adults normally do not worry when they do not hear well or understand about 10% of the information they listen to. They feel quite comfortable with it, as they understand the speech on the whole [10, 12].

In second language teaching, besides the classroom, students are plunged in the target language environment (unless they purposefully avoid it, due to laziness or shyness), so they listen in the target language almost as much as the native speakers, thus, listening to a second language is not a big problem for them, either. However, at language lessons they do fulfill listening activities in order to sharpen their listening skills. Listening skills assessment, unlike mother tongue, is also part of their educational process.

While learning to a foreign language, students spend, probably, 20-30% of time listening to each other, the teacher and the recordings. As only recordings offer them authentic language, their experience of authentic listening in class is only about an hour or two a week, which is nothing, compared to L1 and ESL students. So, obviously, learning to listen efficiently in a foreign language is the most difficult task, which cannot be perfectly fulfilled without much out-of-class practice with the help of the radio, television, video, and computer. This can be done as homework (which again is quite limited in time) or on the student's initiative, which requires intrinsic motivation (not so many students are intrinsically motivated to learn a foreign language and to practice listening, which is, except listening to songs, a very hard work for them). Besides, unfortunately, listening comprehension strategies are seldom taught, so students often get stuck and abandon listening after they hear a couple of unfamiliar words.

While listening to a foreign language, anxiety influences foreign language learners' performance in a quite negative way [15, 20]. The current studies examine the interplay of language difficulties: students who have comprehension difficulties with mother language; they are the same trouble in English as a foreign language [31]. But even students who have effective listening strategies in L1 not necessary are able to transfer them on L2 applications. Second language learners often feel stressed while both learning and using it, it especially concerns listening, as here they feel least confident [5]. The reason is they completely depend on the speaker's pronunciation peculiarities, his/her vocabulary and choice of structures, also they realize their experience in listening to a foreign language is not sufficient. Logically, listening anxiety has a negative effect on learner personal success, while applying the English language.

Stephen Krashen's [22, 23] theory of second language acquisition emphasized the role of listening in the native language acquisition as the main, in fact, in the period preceding literacy, the only source of comprehensible input. For second and especially foreign language acquisition reading is also important, as, in the majority of cases, learners start dealing with the target language when they already have some reading skills in the native language, which permits to develop target language reading skills faster and easier. However, listening is still critically important.

2. Background Information

Before the study, some information will be provided below to have a general perspective on the current condition of teaching listening skills in Iraq and on the concept of Pygmalion Effect.

3. Teaching Listening Skills in Iraqi Kurdistan

Iraq was under British mandate during 1917-1932. After gaining independence in 1932, Iraq formed the Ministry of Education, among other governmental structures, and education management was strictly centralized. The only language of instruction was Arabic. In 1974 Kurdistan Region gained autonomy, after which some schools in the region were permitted to teach in Kurdish [1]. The political instability during the period of 1958-1979, the dictatorship of Saddam Hossein and 2003-2011 war had a traumatic effect on the development of Iraq, including its educational system [17,3].From 2011 the country is trying to restore and improve the educational system. Nowadays the language of instruction in higher education is Arabic for Arab areas and Kurdish for Kurdish area, except for the faculty of medicine and the engineering faculties where the language of instruction is often English. Final theses and doctoral theses are written in Arabic, with an abstract in English [9].

A large project initiated by UNESCO Iraq Office in 2011 has developed a new national curriculum, which requires teaching to be student-centered, applying whole-class and group work. Concerning foreign (mostly English) language teaching, Communicative Language Teaching (CLT) is recommended (Ahmed et al., [2]), however, a lot of teachers still use Grammar Translation Methods, concentrated on grammar and reading skills [3].

From 2014 to 2021 UNESCO is in the process of implementation of the "Education for peace and sustainable development", in the frames of which much help to Kurdish Regional Government as well as Iraqi Federal Government, especially in technical equipment of public schools. International companies contribute to the economic development of countries. They need educated employees with adequate level of English skills, which stimulates the growth of motivation of getting technical education and learning English [3, 4].

In the period of English rule, there were some private English schools opened in 1929 in the country, when the country gained independence, they were shut down, as the majority of teachers and students were not Iraqi citizens. Although nowadays there is certain prejudice towards English as the language of former colonizers as well as American invaders (Iraqi war of 2003-2011, attitude to which is not unanimous in the country), it has gained the reputation of worldwide prestige, as it provides profitable careers in the future [1, 2, 3, 4]. Private schools, where tuition language is mainly English re-opened in the country in 2011.

In contemporary Iraqi context, English is taught as a foreign (not second) language, as there is no environment (to say nothing of radio, television and internet) of English beyond the educational institutions. It is taught in public schools starting with the third grade of primary school, which reveals that much attention is paid to it. In some private schools it is either taught from the first grade or tuition is completely in English. Irrespective much attention paid to teaching English, the country still lacks qualified teachers of English and the teaching methods used (especially in public schools) are too often outdated [1]. As Al Hamdany [3] stated, the students 'study' English, but do not 'learn' (or master) it.

On the other hand, Grajek [14] stated that Iraqi employers view the ability of universities' graduates to communicate in English among top skills. For a country in which unemployment level is high, it is essential to provide university graduates with skills required by the market. The US Embassy contributes to the improvement of the situation by opening language centers, equipping them, training teachers, offering up-to-date educational materials. The government and the universities are very much concerned about raising the English skills' level among the graduates.

If we view IELTS test statistics of Iraqi citizens who took the test in 2015 (assessed in a nine-band score), we will see that the mean points in listening are 5.5, while in reading they are 5.4, in writing – 5.2, and in speaking 5.6, or listening points are the highest after speaking [16].The scores are not too high, but even these scores do not reflect the real situation in the whole country, as this test is taken by the most educated people for visa reasons (getting jobs and/or education abroad).

Irrespective all efforts, the majority of Iraqi undergraduate students' listening skills are not developed on a satisfactory level, as shown in some researches [6, 24].The reasons are the lack of practice of authentic listening [6] and the lack (if not total absence) of listening strategies [24]. According to Bingol's [7] study held with 111 Iraqi (Kurdistan Region) undergraduate students, Iraqi students' main obstacles to listening comprehension are unfamiliar vocabulary and the speed of utterance.

Compared to the rest of Iraq, the situation with education in Kurdistan Region is relatively good. According to the education system in the Iraqi Kurdistan which is shaped in accordance with the British mandatory period in the region, the students who complete the curriculum in the end of the twelfth year and graduate from the high schools, take a university entrance exam in which English is given 5% of the total grade and the English exam does not involve a listening part. Thus, schools do not pay sufficient attention to practicing listening skills. However, private universities in the area make it compulsory for students to pass the listening exam that is a part of the proficiency tests [1]. Natural enough, it is too difficult for school graduates to do so. On the other hand, among the Kurdish population the attitude towards English is better than towards the Arabic language, as it is viewed as an efficient tool for an academic career, employment, and informing the western world on the Kurdish issue. This is a good soil for teaching English [11, 30].

Kurdistan Regional Government (KRG) is doing much to improve the education in the region: 16% of the budget for 2013 was allocated for the education and higher education

sectors. Private sector, which has to be licensed by the government, also contributes a lot to the development of education (between 2006 and 2013 they invested $668 million in educational projects). This is certainly inspiring, but, to make the investments more efficient, it is necessary to investigate the most important problems and the potential ways of solving them [19].

Teaching English is one of the most challenging issues in the Iraqi Kurdistan region, whose capital is Erbil, since population there speaks three main different languages: Kurdish, Arabic and Turkmen, and some minor languages and dialects. Only Arabic alphabet, with its writing from right to left, unites the three, otherwise they are quite different. With population used to Arabic script, teaching any European language with Latin script and writing from left to right (including English) is not easy. An exception is the Northern Kurdish dialect Kurmanji, which uses a modified Latin alphabet [30]. Even while working with computers, educators face many problems, as certain adaptations are needed to be able to use the computer for both Latin and Arabic script. This fact makes it difficult for students and teachers (some of whom are native English speakers) to communicate with each other, but, in the case of teaching English as a foreign language, creates a motivation to use the language for communication among students of different ethnic groups. Still, as Ahmed et al. [2] stated, in Iraq as a part of the Arab world, low English proficiency level is a great obstacle for students as they have a visible difficulty in understanding written texts [2].

In 2003, when the degree of Kurdistan autonomy increased, private schools were re-introduced in the region. Many of them teach English intensively from the first grade, and some provide tuition completely in English. UNESCO opened their office in Erbil in 2007, which stimulates the development of education, including English teaching.

According to an annual trial test exam that is held by the Ishik University, which is called ITCO (abbreviation of the Ishik Test Competition Organization) taken by approximately 4000 students of 12th grades and performed with the permission of the Ministry of Higher Education and Scientific Research in the Kurdistan Region, the level of English learning is not high enough [18].

The reasons lying behind the situation are several. Vernez, Culbertson, & Constant [33, p.16] mentioned that many Kurdish children start schooling at a later age than they should according to the law. They have jotted down that yearly instructional time in the double-shift basic schools is 539 hours while in the single-shift schools; this amount has risen to 693. Nonetheless, the given numbers are less than the OECD average amount of 968 and EU average amount of 965 for the year 2005 [27, p.369].

Besides the curriculum fulfillment problems, insufficient school buildings and instruction time, low quality of textbooks, outdated methods of teaching, deficit of teacher training, lack of updated documents, insufficient technical info and physical conditions of the classrooms in which 40-50 students try hard to study are some other troubles in front of the effective teaching and learning in the Iraqi Kurdistan [30].

According to Yahya [35], who studied the problems faced in the Kurdistan region, the results are mostly to do with the connected speech issues and the lack of suitable strategies (including listening skills) and insufficient general education level. Another research [1] supported what is said above. The average points of students taking the entrance exam are not too high due to the unstandardized English level. If their further education is in English, they usually need to study at preparatory school at the university, to be able to continue their studies in English.

A study on the effects of listening on the students' motivation, held in the Kurdistan region on 100 prep school students has shown that the majority of the participants agree that, as the students improve their perception of listening, their motivation towards language acquisition increases as well [36].

Table 1. The Impact of the Level of Listening Skills on Motivation

Listening Motivation					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Ambivalent	11	11.0	11.0	11.0
	Agree	58	58.0	58.0	69.0
	Strongly Agree	31	31.0	31.0	100.0
	Total	100	100.0	100.0	

[36, p.9].

According to the results given in the table above that was taken from the respective research, a total of 89.0 % of the participants agree that improving listening skills of the learners provides motivation and inspiration depending on the interaction between teacher and learner, which is the result of Pygmalion Effect, in the process of acquiring language [36].

Koran's [21] study showed that teacher motivation helps to improve students' listening and speaking skills. Twenty five teachers in an Iraqi university were assessed by students, administration and themselves as having low, average and high motivation. Then one teacher was at random selected from each group, 55 students with approximately the same level of language skills were placed in their classes and taught listening and speaking, then their pre-, while- and post-experimental test results were compared. It was shown that the most motivated teacher's class made most progress, while the least motivated teacher's class – least progress.

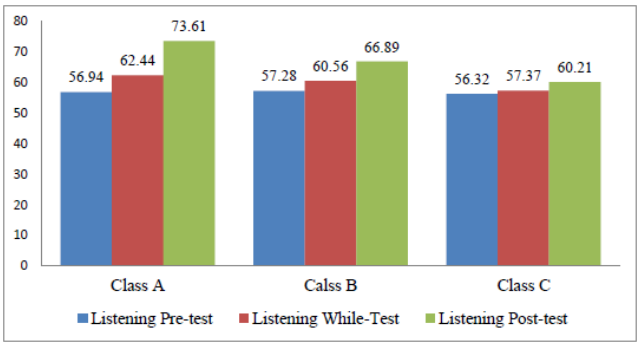

Figure 1. Average results of listening progress tests out of 100 points [21, p.138].

Highly motivated teachers are well-organized, choose creative teaching methods, encourage participation, and provide feedback, etc. Thus, they increase students' output in two main ways – directly (they apply more efficient teaching methods) and indirectly (they motivate students to work harder). Interaction between teacher and students is essential for efficient learning. When the level of positive expectation increases, the success eventually comes out as well. In other words, Pygmalion Effect is operated between teacher and student.

4. Method

The research questions were:

1) What is the level of undergraduate students' listening skills' level in Kurdistan Region (according to students' self-assessment)?
2) What is their listening anxiety level?

To answer these questions in this study, **quantitative research methods**, namely, a survey on listening anxiety among Iraqi undergraduate students and their teachers (Kurdistan Region), were used.

To do this, a **measurement tool** had to be selected and/or developed. The teachers' and students' questionnaires for the nation-wide survey were designed **based on the literature analysis** in the dissertation. They concerned students' listening anxiety level. To provide their **reliability and content validity,** the draft version of the questionnaire was applied with a group of 20 students and 10 teachers, not involved in the study. For the reliability of the results some synonymous items were suggested in order to see whether the answers to them by the same respondent would coincide. When it was not so, the items were omitted or reformulated. The teachers were also asked to provide feedback dealing with the clarity of the items. Eventually, the questionnaire for students involved 16 items that had to be assessed in 5-point Likert scale (from 1 – totally disagree to 5 – completely agree). The questionnaire for teachers was analogous (the items were reformulated like 'I am anxious' → 'The students are anxious", and 4 items dealing with teachers' awareness of Pygmalion Effect were added. After the teachers filled in the questionnaire, they were informed on its goal and were asked whether the items were relevant to the goal, to provide the content validity. A discussion followed, after which some items were removed or reformulated.

The questionnaire was held at various faculties in nine universities in the Kurdistan region in Iraq (seven of them coincided for the students and the teachers, while two were different), the participation was on a volunteer basis. It was available to the participants online for more than a month (from February 28 to April 6, 2017). 98 students and 28 teachers volunteered to participate.

5. Sample

The target community of the study was Iraqi undergraduate students from Kurdistan Region studying English as a foreign language. There are 19 recognized by state universities in the region; the total number of university students is 94,700. The percentage of female students is 48% [26].

Students from eight (five public and three private) universities and teachers from seven universities (four state and three private) participated in the research, which is representative enough. On the other hand, 98 participant students of the survey constitute about 0.1%, which is not too representative. The number of teachers was quite limited, too. The ratio of the genders is more or less representative of the whole region.

Participation in the study was voluntary. The teachers and students were informed that their answers would be anonymous and that at any moment they could quit the study if they found it somehow hurting them.

For the region-wide survey, the researcher published the questionnaire on Ishik University's official Facebook. Besides, Ishik University has memorandums of understanding with other Kurdistan Region universities. A network of connections exists among these universities, so

the researcher addressed some English teachers from these universities to distribute his questionnaires among students and lecturers on paper as well.

Table 2. Kurdistan Region Universities' Survey Participant Students

University	Student number	age	gender	
			m	f
American University	7	17-21	3	4
Basrah University	11	17-21	4	7
Cihan University	9	17-21	5	4
Halabja University	6	17-21	1	5
Kirkuk University	8	17-21	3	5
Koya University	13	17-21	5	8
Salahaddin University	31	17-21	14	17
Erbil University	13	17-21	8	5
Totally	98	Mean age: 19	43	55

Table 3. Kurdistan Region Universities' Survey Participant Teachers

University	teacher number	mean experience	gender	
			m	f
Basrah University	2	16	0	2
Cihan university	3	7	2	1
Halabja university	2	20	1	1
Kirkuk University	1	17	0	1
Koya University	3	9	2	1
Salahaddin University	14	12	8	6
Lebanese French University	3	7	2	1
Totally	28	12	15	13

6. Data Collection and Analysis

The surveys were held both on paper and online and then summed up. The results presented in the dissertation are anonymous. The students were informed that the study findings could in no way impact their grades at university or personal lives.

Survey results were calculated and then transformed into tables, charts and figures. In the questionnaire survey, the overall regional (Iraqi Kurdistan) picture was analyzed.

7. Ethical Issues

The respondents were only volunteers. They knew that the results of the questionnaire would be anonymous and the results would in no way harm their professional reputation or studies. However, they were also informed that they could drop from it if they found some items of the questionnaire inappropriate for them.

8. Kurdistan Region Questionnaire Survey on EFL Listening Anxiety and Teacher Role in Decreasing It

The questionnaire survey dealt with listening anxiety level among Iraqi Kurdish students of EFL. The participants (students and teachers) had to assess 16 items which were analogous for students and teachers in a 5-point Likert scale format (1-totally disagree → 5 – completely agree). The questionnaire was provided to the students both on-paper via their teachers and on-line via Facebook. As for the teachers, they did it online.

Some items in the questionnaires are positive statements (e.g., 'I am usually at ease during listening tests in my language class'), while others are in negative form (e.g., 'I am not nervous while listening to the foreign language in authentic situations'), not to provoke students to answer thoughtlessly. The respondents were told to answer as thoughtfully as they could. The questionnaires for the students were translated in their native tongues, to be well understood. Items 7 and 10 are synonymous, to see whether the answers of each given student are trustworthy. No answer-sheets were discarded, as the answers to these two items did not differ.

98 students from 8 universities participated. The results are presented in Table 4. The number of students who gave the answer is given in the table. The mean of 4.0 or above reveals that the respondents agree with the statement, the answers equal to or below 3.0 reflects that the students disagree with the statement, while the answers between 3.0 and 4.0 deals with the respondents' hesitation.

Table 4. Questionnaire Survey Results: Student Answers

Item #	Item / response / student number who chose the response	1	2	3	4	5	Mean point
1	I am usually at ease during listening tests in my language class.	26	36	32	4	0	2.14
2	I am not nervous while listening to the foreign language in authentic situations	21	42	16	17	2	2.30
3	I feel confident when I listen to recordings in foreign language class.	21	51	18	7	1	2.08
4	I feel confident when I listen to my teacher and classmates in foreign language class	40	37	9	8	4	1.99
5	I feel very self - confident when listening to the foreign language in class.	30	39	20	7	2	2.10
6	It frightens me when I don't understand what the teacher is saying in the foreign language.	4	6	5	46	37	4.08
7	I keep thinking that the other students are better at listening than I am.	1	3	10	38	46	4.28
8	While listening to a foreign language, I can get so nervous I forget things I know.	4	4	14	37	39	4.05
9	Even if I am well prepared for the lesson, I feel anxious while listening.	7	8	4	38	41	4.0
10	I always feel that other students understand while listening to the foreign language better than I do.	2	4	4	44	44	4.27
11	The speakers in recordings speak so quickly that I worry about getting left behind.	2	3	5	50	38	4.25
12	When the speakers do not speak very clearly, I worry about not being able to understand them.	2	8	8	48	32	4.43
13	When the speakers use language, I worry about not understanding them.	2	6	4	50	36	4.14
14	When the topic is not very familiar, I worry about not understanding the text.	3	6	6	51	32	4.05
15	I feel more tense and nervous listening than while speaking, reading or writing.	4	7	2	45	40	4.12
16	I get nervous when I don't understand every word the language teacher / the speakers in the recording use.	6	6	3	41	42	4.09

The statements that express the absence of students' anxiety (items 1-5) all received low points, which means that students' anxiety is quite high (1.99-2.30). The anxiety is especially high in the classroom (1.99 – item 4), and lower in authentic situations (2.30 – item 2), which may mean that students are afraid of assessments of the people they know (teacher and classmates). When they know that nobody is assessing them, they feel more peaceful.

On the other hand, statements which dealt with existing anxiety (items 6-16) yielded high results (4.0- 4.43), which again means that students' anxiety is quite high. Least anxious students are when they are prepared for the lesson (4.0 - item 9), and they are most anxious about not understanding the other speaker due to his/her unclear speech (4.43 – item 12). The declining order of listening anxiety of the respondent deals with:

- Unclear speech (4.43)
- Comparison to other students (4.28 / 4.27)
- Speed of speech (4.25)
- Complicated language (4.14)
- Understanding every word (4.09)
- Teacher's speech (4.08)
- Topic (4.05)
- Being prepared for the lesson (4.0)

It is possible to see that comparison to other students, which can be regulated with the help of Pygmalion Effect, stands the second in the list. Of course, it is impossible to make conclusions about the whole region with a sample of 98 students, but certain trends are visible.

The students supported the statement (item 15) that they are more anxious while listening than when they are speaking, reading or writing (4.12). Some of them (item 8) get so nervous that do not understand things that they know (4.05). This is easy to explain: both psychologically and linguistically (total dependence on the interlocutor for his / her clarity of speech, accent, rate, vocabulary and grammar, no visual support or possibility to elicit the meaning from the interlocutor in case of audio recorded speech) listening comprehension is very complicated.

To make the obtained results more trustworthy, an analogous questionnaire was offered to English teachers working at Iraqi universities of Kurdistan Region. 28 teachers from 7 universities, mostly the same ones from which the students come, but some different, too volunteered to answer the questionnaire. Teachers' view are more professional, besides, they indirectly involve a larger number of participants (i.e., their students), thus, making the survey results more objective.

Table 5. Questionnaire Survey Results: Teacher Answers

Item #	item	1	2	3	4	5	Mean point
1	Students are usually at ease during listening tests in my language class.	9	7	5	6	1	2.39
2	Students are not nervous while listening to the foreign language in authentic situations	7	12	5	2	2	2.29
3	Students feel confident when they listen to recordings in foreign language class.	9	6	5	3	5	2.61
4	Students feel confident when they listen to the teacher and classmates in foreign language class	6	7	6	5	4	2.79
5	Students feel very self - confident when listening to the foreign language in class.	9	6	5	2	6	2.64
6	It frightens students when they don't understand what the teacher is saying in the foreign language.	0	2	5	10	11	4.07
7	Students keep thinking that the other students are better at listening than I am.	1	1	5	11	10	4.0
8	While listening to a foreign language, students can get so nervous they forget things they know.	0	2	4	10	12	4.14
9	Even if a student is well prepared for the lesson, she/he feels anxious while listening.	1	1	4	11	11	4.07
10	Students always feel that other students understand while listening to the foreign language better than they do.	0	3	4	12	9	3.96
11	The speakers in recordings speak so quickly that students worry about getting left behind.	0	1	4	10	13	4.25
12	When the speakers do not speak very clearly, students worry about not being able to understand them.	0	0	3	7	18	4.54
13	When the speakers use complicated language, students worry about not understanding them.	0	1	4	11	12	4.21
14	When the topic is not very familiar, students worry about not understanding the text.	1	1	4	12	10	4.04
15	Students feel more tense and nervous listening than while speaking, reading or writing.	1	1	3	10	13	4.18
16	Students get nervous when they don't understand every word the language teacher / the speakers in the recording say.	0	2	2	10	13	4.11
17	If I treat students as able language learners, their anxiety will decrease.	2	2	3	7	14	4.14
18	Lower anxiety will help improve students' listening comprehension	0	2	4	11	11	4.04
19	If I tell students in the process of listening activities that they can do well, their level of listening skills will increase.	0	2	5	11	10	4.04
20	Students will benefit from listening skills' assessment only if constructive feedback is provided to them.	1	2	4	10	11	4.0

Similarly to the students, the teachers disagree with the statement that their listening anxiety is low (items 1-5: mean results 2.29-2.79 points).

Also similarly to the students, teachers agree with the statement that students' listening anxiety is high (items 6-14): mean results from 3.96 to 4.54. The declining order of listening anxiety, in teachers' view, deals with:

- Unclear speech (4.54)
- Speed of speech (4.25)
- Complicated language (4.21)
- Understanding every word (4.11)
- Teacher's speech (4.07) / Being prepared for the lesson (4.07)
- Topic (4.04)
- Comparison to other students (3.96 /4.0)

It is easy to notice that the order in which the students' anxiety declines as assessed by the teachers is almost the same as in the students' answers.

The students supported the statement (item 15) that they are more anxious while listening than when they are speaking, reading or writing (4.18). Some of them (item 8) get so nervous that do not understand things that they know (4.14).

Items 17-20 deal with teachers' awareness with the ideas of Pygmalion Effect is high: their answers are between 4.0 and 4.14. The researcher consciously did not include the term 'Pygmalion Effect' in the questionnaire, as his goal was not to find out whether teachers know the term, but whether they share the ideas.

9. Conclusions

The questionnaire survey held with 98 students and 28 teachers from 8 universities in Iraqi Kurdistan Region has shown that Language learners' listening skill level does not correspond to international requirements. Listening anxiety constitutes a real problem for the respondents.

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According to Candidate Teachers Views Classroom Management Problems of Teachers in Traditional and Technology-supported Classrooms

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Abstract In this research, it is aimed to investigate classroom management problems of middle school 6th and 7th grade teachers in traditional and technology-supported classrooms and differences between them. For this purpose the opinions of the students in the 4th grade of Primary Education Department in Faculty of Education of Süleyman Demirel University have been taken. In data analysis, t- test was used by calculating the arithmetic mean. As a result of the research it has been found that technology-supported classrooms are more aesthetic than traditional classrooms, but lighting is insufficient in technology-supported classrooms, teachers do not change the methods and techniques they use during the course in both traditional and technology-supported classrooms, the use of technology in classrooms provides teachers with help in managing the time, teachers in both traditional and technology-supported classrooms prefer standing at the same point but teachers in technology-supported classrooms can motivate students more easily and the use of technology makes no difference in the frequency of undesired behaviors out of the course.

Keywords Classroom Management, Educational Technologies, Technology-supported Classrooms

1. Introduction

Technology has an important place in our daily life as an indispensable part of our age. Significant developments in science and technology in recent years have affected the societies and their structures, and necessitated changes in numerous fields in societies. Societies have begun to restructure according to the developments in technology. Effects of technology have been observed very quickly especially in the areas such as structure of state, health and business world. In the 21st century, in which it is not possible to avoid from the effects of technology, educational systems and educational institutions have been affected by these developments. Therefore, making changes in education has become a necessity.

With rapid changes in technology, the use of educational technology has become widespread in educational institutions. First, computers took part in school managers' rooms, then entered into the educational environment with computer laboratories and after that, it has become widespread in classrooms [1]. With interactive boards, one of the educational technologies; the substantiality of educational environments has increased positively every passing day. Today, educational technologies have become indispensable for classroom environments, and classes have got rid of classical structures and have become classes that have more educational equipment.

All these changes in technology also change the role of the teacher in the classroom. At the present time, a teacher is a counselor showing learners how to learn, what to learn, where to learn and where to use the things they learn; rather than relaying them the information. Although technology has come to the fore, it can never take the place of a teacher. Hence, educational technologies are used as a tool rather than a purpose. Improvements in educational technologies have affected educational environments and educational programs, besides changing the educational tools and classroom environments; in this way, it has brought a new dimension. [2; 3; 4; 5].

The use of tools in education is undeniably important because the effect of tools in education is quite excessive. Tools have become and will continue to become the handmaid of teachers in the classrooms and [6]. Educational environments, which formerly included only books, black board, pictures, overhead projectors and cinematographs [5], have shown up with different dimensions along with the technology. Especially with the entrance of computers and interactive boards into educational environments, tools have improved more. Visual elements and audial elements have created multimedia by combining with each other. Thus

technology has started to increase its existence in classroom environments. There are many benefits of use of technology in the classroom environment. Some of these benefits can be expressed as that it makes learning concrete, ensures permanent learning, makes students active in learning, makes classroom environments enjoyable and amusing, decreases monotony, provides teachers with advantage in time management, motivates the students for lessons, makes teaching more efficient, provides teachers with highly important support in terms of practice, enables bringing the outer happenings into the classroom environment. [7; 6; 8; 3].

Besides all these educational benefits of using technology in classrooms, it is also beneficial for classroom management. Classroom management is the first step of educational management. It is important to regulate classroom management for an effective education. Classroom management is composing an environment which provides a proper education and regulating the process by using classroom sources effectively [9].

To be able to mention about the effects of technology on classroom management, dimensions of classroom management should be examined. Başar [9] mentions about five dimensions of classroom management;

The first dimension of classroom management is physical organization of classroom environment. In order to be able to provide effective learning and classroom management, physical properties in the classroom must be suitable and sufficient [10]. Behavioral change defined as education takes place in proper environments. Each variable related with physical environment can support education or obstruct it as well. The effect of physical properties in the classroom can change depending on the arrangement, the way of usage and the appearance [9]. Arranging learning-teaching environments in the first place is very important to be able to make given knowledge long lasting and permanent and transform it into behavior by internalizing. The arrangement of environments, which has become more complicated with the entrance of technology into the education environments, will improve the quality of education and help reach the purposes.

The second dimension of classroom management is managing the planning and programming activities. A teacher should know how to prepare effective plans and programs to be an effective classroom manager [11]. Plans and programs are very important for technology-supported environments, too. Teachers should not be passive; rather they should be active in the arrangement of technologic environments. If a teacher cannot arrange teaching methods and equipment which are suitable for technological environment, s/he is going to have problems about managing the learning environment [5]. A Teacher should execute her/his plan in an order in the classroom. In order to do so, applications should be tried by the teacher in advance. Otherwise problems may arise in educational environment; there may be loss of time and undesired situations may be experienced. Pre-arranging and predetermining the educational activities, sources, the process, the equipment, characteristics of students will enable the educational services to be more effective. The third dimension of classroom management is time management. In classroom management it is highly important for teachers to use the time efficiently. A teacher should use the time well to be able to teach well and to be a good classroom manager. Wasted time cannot be replaced with a new one, and there is no turning back. Because of that, purposes should be chosen wisely, and time should be managed carefully to reach these purposes [12]. Especially in the technology-supported environments time should be managed well. Teachers should avoid wasting time trying to fix a problem faced while using the technology, and they should arrange the time in accordance with the lesson schedule. Teachers should be able to consume the time by producing.

The fourth dimension of classroom management is the relationship layout of the classroom. In-class relations are effective to form positive learning environment. Teacher-student and student-student interactions, determining classroom rules and infusing these rules into students, applications concerning the facilitation of classroom life constitute relationship layouts [9]. Education is an interaction process. The tool of this interaction is communication. Therefore, communication process is the essential requirement for education [13]. It is not possible to manage without communication. In that case, a successful manager is expected to use the intricacies of communication art very well. [14]. In the technology-supported environments equipment may affect students' attention in communication both positively and negatively. In the technology-supported environments changes between student-student and teacher-student interactions are inevitable. By means of technology, teachers should be able to reach students and have contact with them both in and out of the classroom. In addition, teachers should have communicative skills as well that can affect students as much as technology-supported environments. For this reason, teachers should increase the ratio of effect on the relationship arrangement in technology-supported environments.

The fifth dimension of classroom management is behavior arrangement. This dimension consists of making the classroom environment able to provide desired behavior, making the classroom climate positive, estimating problems beforehand, making students obey the classroom rules, changing the undesirable behaviors. Besides giving information in the classroom environment, teachers make students gain desired behaviors. In order to do so, teachers should exhibit model behaviors in the classroom environment [9]. In the technology-supported environments , the frequency of facing with undesired behaviors between the teacher and students. Because, having more intimacy with technology causes problems in human relations. Therefore, it has become a necessity for both teachers and students to know what they should be cautious for while

using the technology.

There are many sources of problems encountered in the dimensions mentioned above in traditional and technology-supported classes. Some of these are development characteristics, mental sufficiency, student success, student motivation; physical situation of school, structure of relationships, inconsistency in rules, attitude of management, using the same teaching methods and techniques, not being able to communicate with students, not being able to use equipment efficiently, approaches to students' behaviors [9; 15].

At the present time, physical structure of classrooms, success levels of students, teaching methods and techniques of teachers and classroom equipment have changed. These changes have affected the classroom management problems and caused changes

Aim of The Research In this research, it is aimed to determine the classroom management problems of teachers, teaching 6th and 7th grade students at middle schools, in terms of physical organization, plans and programs, time management, relationship layout and behavior arrangement dimensions of classroom management in traditional and technology-supported classrooms and to determine differences about classroom management problems between these two groups, according to candidate teachers' views.

In the direction of this general aim, sub objectives are determined as;

According to candidate teachers' views,

1. What are the classroom management problems of middle school 6th and 7th grade teachers in traditional and technology-supported classrooms in terms of physical organization dimension of classroom management?
2. What are the classroom management problems of middle school 6th and 7th grade teachers in traditional and technology-supported classrooms in terms of plans and programs dimension of classroom management?
3. What are the classroom management problems of middle school 6th and 7th grade teachers in traditional and technology-supported classrooms in terms of time management dimension of classroom management?
4. What are the classroom management problems of middle school 6th and 7th grade teachers in traditional and technology-supported classrooms in terms of relationship layout dimension of classroom management?
5. What are the classroom management problems of middle school 6th and 7th grade teachers in traditional and technology-supported classrooms in terms of behavior arrangement dimension of classroom management?
6. Is there any difference between the classroom management problems of middle school 6th and 7th grade teachers in traditional and technology-supported classrooms in terms of physical organization, plans and programs, time management, relationship layout and behavior arrangement dimensions of classroom management?

2. Method

Research Model

This study was designed in the general survey model based on the quantitative data. Numerical data such as numbers and measurements are called quantitative data and analysis using these numbers and values is called quantitative data analysis [16]. Survey models are research approaches that aim to describe past or present situations as they exist, without changing them. The object and the individual that are the issues of the research are evaluated and described within their existing conditions [17].

Population and Sample

Candidate teachers studying at Süleyman Demirel University Faculty of Education in the 2016-2017 school year constitute the population of the research. Süleyman Demirel University Faculty of Education Primary Education Department 4th grade students constitute the sample of the research. Students were asked to evaluate 6th and 7th grade teachers, by the given scale, at schools they went for practicum and made observation for the lesson of teaching practice in spring semester 2016-2017 education year. These schools were Isparta merkez Yedi Şehitler, Bağlar, Nazmiye Demirel, Ülkü, Nazmi Toker, Iyaş, Gülistan, Kadir Boylu, İTO Şehit Mustafa Gözütok Middle Schools. In line with this purpose, questionnaires were conducted to 82 students and 79 of these questionnaires have been used as valid. The constituted measuring instrument was applied to 38 classrooms which technology was not used and 41 classrooms which technology was used. The research sample is bounded with 6th and 7th grade teachers because 5th grade is the first grade of middle school and 8th grade students are mostly trying to prepare for examination of passing from primary education to secondary education (teog).

Data Collection and Analysis

In the research, the data collection instrument developed by Özata [18] has been used by taking related expert opinions rearranging it according to the aim of the research. The reliability of the data collection instrument is tested as r = 0.92. The data collection tool consists of two parts. In the first part, there exists a general information concerning if the teacher uses a technological instrument or not, in the second part, there are questions related with the dimensions of classroom management. Four Point Likert-type scales have

been used to collect the data.

SPSS 15 packet program has been used to analyze the data. For classroom management problems in traditional classrooms and technology-supported classrooms, the arithmetic mean of the factors have been taken and then ranked. Independent samples t-test has been used to analyze whether there is a significant difference between classroom management problems in two groups. In the analysis of the data, the range of points that can explain the level of efficiency of classroom management problems has been determined because the answers given by the students are from the four Point Likert-type scales.

3. Findings and Interpretations

Findings and comments about first sub problem "according to candidate teachers' views, the classroom management problems of middle school 6th and 7th grade teachers in traditional and technology-supported classrooms in terms of physical dimension of classroom management".

Table 1. The classroom management problems in classrooms without technology (traditional classrooms) in terms of "physical arrangement dimension" of classroom management.

	N	Mean	SD
Lighting conditions of classroom is proper for education.	38	3,45	0,68
Cleaning of class is supplied.	38	2,47	1,09
The class is at the ideal temperature.	38	2,36	1,02
The ventilation of class is sufficient.	38	2,31	1,11
The noise level in the class is normal.	38	2,26	0,92
Equipment in class is sufficient.	38	2,21	0,99
The appearance of class is aesthetic.	38	2,15	1,17

At Table 1, in traditional classrooms, lighting conditions of classroom is always proper for education ($\overline{X}$= 3,45). Temperature ($\overline{X}$=2,36), ventilation ($\overline{X}$=2,31) and noise level ($\overline{X}$=2,26) of classrooms seem to be sufficient sometimes. According to the results, in traditional classrooms equipment number is insufficient ($\overline{X}$=2,21) and the classroom is never aesthetic ($\overline{X}$=2,15). In traditional classrooms there is no problem in terms of lighting, ventilation, temperature and noise level but there are problems in terms of number of equipment and classroom appearance.

Table 2. The classroom management problems in technology-supported classrooms in terms of "physical arrangement dimension" of classroom management

	N	Mean	SD
Equipment in class is sufficient.	41	3,07	0,64
The ventilation of class is sufficient.	41	2,97	0,79
The appearance of class is aesthetic.	41	2,92	0,78
The noise level in the class is normal.	41	2,65	0,61
Cleaning of class is supplied.	41	2,58	0,64
The class is at the ideal temperature.	41	2,65	0,59
Lighting conditions of classroom is proper for education.	41	1,65	0,91

At Table 2, it is understood that in terms of physical conditions, classes are generally aesthetic ($\overline{X}$=2,92) and adequate in terms of equipment ($\overline{X}$=3,07) in technology-supported classrooms. Classroom ventilation ($\overline{X}$=2,97), noise level ($\overline{X}$=2,65), temperature ($\overline{X}$=2,65) seem to be generally sufficient. However, lighting conditions of classrooms are never proper for education ($\overline{X}$=1,65). The number of equipment is enough in technology-supported classrooms and thus classrooms seem more aesthetic. Some problems occur in the level of illumination because the projection equipment and the interactive boards are used in the technology-supported classrooms. Size of the windows, arrival angle of the light and insufficiency of curtains may be the source of the problem.

Findings and comments about the second sub problem "according to candidate teachers' views, the classroom management problems of middle school 6th and 7th grade teachers in traditional and technology-supported classrooms in terms of plans and programs dimension of classroom management".

Table 3. The classroom management problems in classrooms without technology (traditional classrooms) in terms of "plans and programs dimension" of classroom management

	N	Mean	SD
The teacher plans classroom activities in advance.	38	2,55	1,00
The teacher makes equipment ready before starting the course.	38	1,84	0,88
The teacher changes method and techniques used in classroom.	38	1,74	0, 67

When traditional classrooms are examined in terms of plans and programs dimension, results show that the teacher usually plans classroom activities in advance ($\overline{X}$=2,55). In traditional classrooms the teacher sometimes makes equipment ready before starting the course ($\overline{X}$=1,84) but rarely changes method and techniques used in classroom ($\overline{X}$=1,74). The fact that the traditional classes are in a uniform structure may cause the teachers not to use any methods other than classical methods.

Table 4. The classroom management problems in technology-supported classrooms in terms of "plans and programs dimension" of classroom management

	N	Mean	SD
The teacher plans classroom activities in advance.	41	2,78	0,85
The teacher makes equipment ready before starting the course.	41	2,34	0,53
The teacher changes method and techniques used in classroom.	41	1,95	0,50

It is found that in technology-supported classrooms teachers sometimes change the methods and techniques they use instead of using the same methods and techniques ($\overline{X}$=1,95). As it has been observed in traditional classrooms, teachers plan classroom activities in advance ($\overline{X}$=2,78) and make equipment ready before starting the course ($\overline{X}$=2,34). But teachers slightly change the methods and techniques used in the classroom.

Findings and comments about third sub problem "according to candidate teachers' views, the classroom management problems of middle school 6th and 7th grade teachers in traditional and technology-supported classrooms in terms of time dimension of classroom management".

Table 5. The classroom management problems in classrooms without technology (traditional classrooms) in terms of "time management dimension" of classroom management

	N	Mean	SD
The teacher can use time effectively during the course.	38	2,36	0,94
The teacher can use course equipment sufficiently and effectively.	38	2,28	0,83
The teacher can provide vitality during the course, does not bore students.	38	2,00	0,77
Classroom environment is an environment that students want to spend most of their time.	38	1,89	0,89

According to Table 5 in traditional classrooms teachers sometimes cannot use time ($\overline{X}$=2,36) and equipment ($\overline{X}$=2,28) sufficiently and effectively. The findings show that the students can get bored ($\overline{X}$=2,00) because the teachers cannot provide vitality during the course, and also classroom environment can be seen as an environment that students don't want to spend most of their time ($\overline{X}$=1,89).

Table 6. The classroom management problems in technology-supported classrooms in terms of "time management dimension" of classroom management

	N	Mean	SD
The teacher can use time effectively during the course.	41	3,29	0,60
The teacher can use course equipment sufficiently and effectively.	41	3,24	0,76
The teacher can provide vitality during the course, does not bore students.	41	3,02	0,72
Classroom environment is an environment that students want to spend most of their time.	41	2,80	0,81

It seems that teachers are sufficient in terms of time management in technology-supported classrooms. It has been found that in technology-supported classrooms teachers can use course equipment sufficiently and effectively ($\overline{X}$=3,29) and can use time effectively during the course ($\overline{X}$=3,24). Since in technology-supported classrooms teachers can use course equipment sufficiently and effectively, they can provide vitality during the course, and this does not bore students.

Findings and comments about the second sub problem "according to candidate teachers' views, the classroom management problems of middle school 6th and 7th grade teachers in traditional and technology-supported classrooms in terms relationship layout dimension of classroom management".

Research results show that in traditional classrooms teachers usually walk all over the classroom ($\overline{X}$=2,68) and use their voice as everyone can hear them in the classroom ($\overline{X}$=2,57). According to Table 7 teachers avoid using body language ($\overline{X}$=1,97) and multidirectional communication with students ($\overline{X}$=1,84) in traditional classrooms. It seems that in traditional classrooms teachers have difficulty about motivating students ($\overline{X}$=1,73) and attracting students attention to the course ($\overline{X}$=1,92) and therefore, students behave shy($\overline{X}$=2,60).Teachers do not consider individual differences of students adequately ($\overline{X}$=1,71) and avoid prompting students to make group work ($\overline{X}$=2,00). As a result of these situations, teachers cannot make students to participate in the lessons ($\overline{X}$=2,23).

Table 7. The classroom management problems in classrooms without technology (traditional classrooms) in terms of "relationship layout dimension" of classroom management

	N	Mean	SD
The teacher is walking all over the classroom.	38	2,68	0,99
Students behave shy.	38	2,60	1,10
The teacher uses her/his voice as everyone can hear in the classroom.	38	2,57	0,97
The teacher gives the students the right to speak.	38	2,36	1,05
The teacher makes eye contact with students.	38	2,00	0,92
The teacher can provide the participation of the students.	38	2,23	0,81
The teacher stands at the same point in the classroom and does not move.	38	2,05	1,06
The teacher prompt students make group work.	38	2,00	1,02
The teacher cares to use body language during communication.	38	1,97	0,91
The teacher can easily attract students' attention toward course.	38	1,92	0,85
The teacher provides multidirectional communication.	38	1,84	0,82
The teacher can easily motivate students.	38	1,73	0,89
The teacher pays attention individual differences.	38	1,71	0,78

Table 8. The classroom management problems in technology-supported classrooms in terms of "relationship layout dimension" of classroom management

	N	Mean	SD
The teacher can easily motivate students.	41	3,48	0,59
The teacher can easily attract students' attention toward course.	41	3,39	0,66
The teacher gives the students the right to speak.	41	3,31	1,05
The teacher can provide the participation of the students.	41	3,12	0,74
The teacher cares to use body language during communication.	41	3,07	0,72
The teacher provides multidirectional communication.	41	2,95	0,73
The teacher is walking all over the classroom.	41	2,87	0,81
The teacher uses her/his voice as everyone can hear in the classroom.	41	2,65	0,71
The teacher prompts students do group work.	41	2,36	0,85
The teacher stands at the same point in the classroom and does not move.	41	2,53	0,74
Students behave shy.	41	1,95	0,77
The teacher pays attention individual differences.	41	1,97	0,76
The teacher makes eye contact with students.	41	1,73	1,07

Table 8 shows that in technology-supported classrooms teachers can motivate students ($\overline{X}$=3,48) and easily attract their attention to the course ($\overline{X}$=3,39). Using technological equipment in education attracts students' attention to the course and by this way teachers can motivate students more easily. This situation can be counted as one of the reasons of an increase in student participation ($\overline{X}$=3,12). Students sometimes behave shy ($\overline{X}$=1,95) in technology-supported classrooms and the teachers in these classrooms can have problems in making eye contact with students ($\overline{X}$=1,73). The reasons of this situation can be teachers' not changing the methods and techniques in the classrooms and not caring about individual differences.

Findings and comments about the fifth sub problem "according to candidate teachers' views, the classroom management problems of middle school 6th and 7th grade teachers in traditional and technology-supported classrooms in terms of behavior arrangement dimension of classroom management".

Table 9. The classroom management problems in classrooms without technology (traditional classrooms)in terms of "behavior arrangement dimension" of classroom management

	N	Mean	SD
Students walk needlessly in classroom.	38	3,31	0,96
Students show aggressive behaviors to each other.	38	2,60	0,97
Students perform assigned tasks.	38	2,42	0,82
Students disturb their friends during the course.	38	2,28	0,89
The teacher can provide positive classroom environment.	38	2,28	0,86
Students talk without permission.	38	2,26	0,75
Students do homework on time.	38	2,24	0,91
Students come to course on time.	38	2,21	1,07
Students are disposed to use course equipment.	38	2,21	1,04
Students care to obey classroom rules.	38	2,15	0,75
The teacher can overcome many events take place in classroom.	38	1,97	0,92

When classroom management problems in traditional classroom are examined in terms of behavior arrangement dimension, it is found that the biggest problem is students' walk needlessly in the classroom ($\overline{X}$=3,31). Table 9 shows that students usually show aggressive behaviors to each other ($\overline{X}$=2,60). In addition to that it can be seen that students sometimes talk without permission ($\overline{X}$=2,26), disturb their friends during the course ($\overline{X}$=2,28). Even if students sometimes care to obey classroom rules ($\overline{X}$=2,15), the average is low. Besides, results show that teachers have difficulty in overcoming many events that take place in classrooms ($\overline{X}$=1,97). In traditional classrooms students act numerous negative behaviors and teachers have difficulty coping with these problems.

Table 10. The classroom management problems in technology-supported classrooms in terms of "behavior arrangement dimension" of classroom management

	N	Mean	SD
The teacher can provide positive classroom environment.	41	3,21	0,68
Students are disposed to use course equipment.	41	3,09	0,80
Students perform assigned tasks.	41	2,97	0,56
Students care to obey classroom rules.	41	2,85	0,47
Students do homework on time.	41	2,65	0,82
Students come to course on time.	41	2,43	0,69
Students show aggressive behaviors to each other.	41	2,41	0,74
The teacher can overcome many events take place in classroom.	41	2,31	0,52
Students disturb their friends during the course.	41	2,24	0,61
Students walk needlessly in classroom.	41	2,00	0,59
Students talk without permission.	41	1,97	0,52

Results show that in technology-supported classrooms teachers usually can provide positive classroom environment ($\overline{X}$=3,21). Also it seems that students usually perform assigned tasks ($\overline{X}$=2,97) and care to obey classroom rules ($\overline{X}$=2,85). Even the students exhibit undesired behaviors, the average points are low. Students sometimes disturb their friends during the course ($\overline{X}$=2,24), walk needlessly in the classroom ($\overline{X}$=2,00) and talk without permission ($\overline{X}$=1,97). Even if the use of technology causes decrease in some behavioral problems, many problems still continue.

Findings and comments concerning the sixth sub problem "according to candidate teachers' views, difference in the classroom management problems of middle school 6th and 7th grade teachers in traditional and technology-supported classrooms in terms of physical organization, plans and programs, time management, relationship layout and behavior regulation dimensions of classroom management.

Table 11. Differences in classroom management problems with regard to physical organization dimension in traditional and technology-supported classrooms

	Group	Mean	t	p
The class is at the ideal temperature.	Traditional Classrooms	2,36	-1,40	0,166
	Technology-supported Classrooms	2,65		
Lighting conditions of classroom is proper for education.	Traditional Classrooms	3,44	9,90	0,000
	Technology-supported Classrooms	1,65		
The noise level in the class is normal.	Traditional Classrooms	2,26	-2,22	0,030
	Technology-supported Classrooms	2,65		
Cleaning of class is supplied.	Traditional Classrooms	2,47	-0,48	0,627
	Technology-supported Classrooms	2,58		
Equipment in class is sufficient	Traditional Classrooms	2,21	-4,54	0,000
	Technology-supported Classrooms	3,07		
The appearance of class is aesthetic.	Traditional Classrooms	2,15	-3,39	0,001
	Technology-supported Classrooms	2,92		
The ventilation of class is sufficient.	Traditional Classrooms	2,31	-3,00	0,004
	Technology-supported Classrooms	2,97		

P<0,050

Some differences have been found between traditional and technology-supported classrooms in terms of physical variables. Technology-supported classes are darker than traditional classrooms (t=-9,90). The reason for that can be the use of tools to inhibit the light coming from the outside in technology-supported classrooms. And also it has been found that technology-supported classrooms have more aesthetic appearance (t=-3,39) and are more sufficient in terms of equipment (t=-4,54). Furthermore, the results show that the ventilation of technology-supported classrooms is more sufficient than the traditional classroom ventilation. There is no significant difference between two groups in terms of cleanliness and temperature of the classroom.

Table 12. Differences in classroom management problems with regard to plans and programs dimension in traditional and technology-supported classrooms

	Group	Mean	t	P
The teacher plans classroom activities in advance.	Traditional Classrooms	2,55	-1,08	0,280
	Technology-supported Classrooms	2,78		
The teacher changes method and techniques used in classroom.	Traditional Classrooms	1,71	-7,46	0,114
	Technology-supported Classrooms	1,95		
The teacher makes equipment ready before starting the course.	Traditional Classrooms	1,84	-3,01	0,004
	Technology-supported Classrooms	2,34		

P<0,050

There is no significant difference between technology-supported classrooms and traditional classrooms in terms of planning activities (t=-1,08). In both groups it is seen that teachers sometimes make plans. Both in technology-supported and traditional classrooms teachers always use the same methods. Any significant difference between these two groups in terms of changing the methods and techniques used in the classroom has not been found (t=-7,46). But it has been observed that in technology-supported classrooms teachers make equipment ready before starting the course more often than the teachers do in traditional classrooms.

Table 13. Differences in classroom management problems with regard to time management dimension in traditional and technology-supported classrooms

	Group	Mean	t	P
The teacher can use time effectively during the course.	Traditional Classrooms	2,36	-4,507	0,000
	Technology-supported Classrooms	3,24		
The teacher can use course equipment sufficiently and effectively.	Traditional Classrooms	2,28	-6,083	0,000
	Technology-supported Classrooms	3,29		
Classroom environment is an environment that students want to spend most of their time.	Traditional Classrooms	1,89	-4,72	0,000
	Technology-supported Classrooms	2,80		
The teacher can provide vitality during the course, does not bore students.	Traditional Classrooms	2,00	-6,075	0,000
	Technology-supported Classrooms	3,02		

P<0,050

Table 13 shows that there is a significant difference (t=-4,507) between traditional classrooms and technology-supported classrooms in terms of using time effectively during the course. This means that in technology-supported classrooms teachers use time more effectively during the course. It seems that in technology-supported classrooms teachers use course equipment more effectively (t=-6,083). By this way, these teachers provide vitality during the course and do not bore students (t=-6,075). This can be the reason that makes students want to spend more time (t=-4,72) in technology-supported classrooms.

Table 14. Differences in classroom management problems with regard to relationship layout dimension in traditional and technology-supported classrooms.

	Group	Mean	t	P
The teacher can easily motivate students.	Traditional Classrooms	1,73	-10,182	0,000
	Technology-supported Classrooms	3,48		
The teacher can easily attract students attention toward course.	Traditional Classrooms	1,92	-8,502	0,000
	Technology-supported Classrooms	3,39		
The teacher provides multidirectional communication.	Traditional Classrooms	1,84	-6,282	0,000
	Technology-supported Classrooms	2,95		
The teacher makes eye contact with students.	Traditional Classrooms	2,00	2,105	0,065
	Technology-supported Classrooms	1,73		
The teacher gives students the right to speak.	Traditional Classrooms	2,36	-4,641	0,000
	Technology-supported Classrooms	3,31		
The teacher can provide the participation of the students.	Traditional Classrooms	2,23	-5,000	0,000
	Technology-supported Classrooms	3,12		
The teacher stands at the same point in the classroom and does not move.	Traditional Classrooms	2,05	-2,325	0,023
	Technology-supported Classrooms	2,53		
The teacher prompt students make group work.	Traditional Classrooms	2,00	-1,915	0,060
	Technology-supported Classrooms	2,36		
The teacher uses her/his voice as everyone can hear in the classroom.	Traditional Classrooms	2,57	-3,396	0,0694
	Technology-supported Classrooms	2,65		
The teacher is walking all over the classroom.	Traditional Classrooms	2,68	-1,221	0,226
	Technology-supported Classrooms	2,87		
The teacher cares to use body language during communication.	Traditional Classrooms	1,81	-4,576	0,000
	Technology-supported Classrooms	2,46		
The teacher pays attention individual differences.	Traditional Classrooms	1,71	-1,483	0,142
	Technology-supported Classrooms	1,97		
Students behave shy.	Traditional Classrooms	2,60	-4,724	0,000
	Technology-supported Classrooms	1,95		
P<0,050				

In technology-supported classrooms teachers can motivate students (t=-10,182) and attract students' attention to the course (t=-8,502) more easily than in traditional classrooms. In technology-supported classrooms, teachers care to use body language during communication (t=-4,576), give the students the right to speak (t=-4,641) and can provide the participation of the students (t=-5,000). But in technology-supported classrooms it is seen that students behave shy (t=-4,724). The reason may be that students are not familiar with this equipment or they have obstacles in communication with their teachers. Likewise, in technology-supported classrooms teachers usually stand at the same point in the classroom and does not move (t=-2,325). The source of this problem may be that teachers do not know how to use technological equipment in the direction of their aims.

Table 15. Differences in classroom management problems with regard to behavior arrangement dimension in traditional and technology-supported classrooms.

	Group	Mean	t	P
The teacher can provide positive classroom environment.	Traditional Classrooms	2,28	-5,250	0,000
	Technology-supported Classrooms	3,21		
The teacher can overcome many events take place in classroom.	Traditional Classrooms	1,97	-1,785	0,078
	Technology-supported Classrooms	2,31		
Students do homework on time.	Traditional Classrooms	2,24	-1,693	0,034
	Technology-supported Classrooms	2,65		
Students show aggressive behaviors to each other.	Traditional Classrooms	2,60	3,249	0,328
	Technology-supported Classrooms	2,41		
Students perform assigned tasks.	Traditional Classrooms	2,42	-3,447	0,001
	Technology-supported Classrooms	2,97		
Students behave shy.	Traditional Classrooms	2,60	3,029	0,004
	Technology-supported Classrooms	1,95		
Students care to obey classroom rules.	Traditional Classrooms	2,34	-4,254	0,010
	Technology-supported Classrooms	2,85		
Students walk needlessly in classroom.	Traditional Classrooms	3,31	7,258	0,000
	Technology-supported Classrooms	2,00		
Students talk without permission.	Traditional Classrooms	2,26	2,852	0,052
	Technology-supported Classrooms	1,97		
Students come to course on time.	Traditional Classrooms	2,21	-1,180	0,243
	Technology-supported Classrooms	2,43		
Students are disposed to use course equipment.	Traditional Classrooms	2,21	-4,215	0,000
	Technology-supported Classrooms	3,09		
Students disturb their friends during the course.	Traditional Classrooms	2,28	0,406	0,686
	Technology-supported Classrooms	2,24		

P<0,050

It has been found out that teachers have less trouble in providing positive classroom environment in technology-supported classrooms, compared to traditional classrooms (t=-5,250). Besides, it is seen that in technology-supported classrooms students usually perform assigned tasks (t=-3,447) and do homework on time (t=-1,693). The most important reason for this may be that students are more interested in technology and they prefer to prepare their homework faster by using technology. In technology-supported classrooms students behave less shy in comparison to traditional classrooms (t=3,029). But there is no significant difference between two groups regarding the averages of showing aggressive behaviors to each other (t=3,249), averages of talking without permission (t=2,852) and disturbing their friends during the course (t=0,406). There are some similarities in behavior problems that occur in technology-supported and traditional classrooms. Using technology in the classrooms did not cause any change in frequency of occurrence of many undesired behaviors. That the teachers have difficulties in managing the technology or they prefer to deal with the problems they face in the use of technology may be the reason for negative behaviors.

4. Conclusions and Recommendations

Research results show that problems, which occur in terms of some dimensions of classroom management in traditional classrooms, occur less in technology-supported classrooms. But one of the important findings of the research is that the use of technology in classrooms brings about some new problems in terms of some dimensions of classroom management.

Hence, organizing education environments by considering some criteria will both increase the efficiency of education and facilitate achieving the goals intended. When evaluated in terms of physical variables, using technology makes the appearance of classrooms more aesthetic. The number of instruments used in the classrooms increase depending on the use of technology. By this way, technologic equipment change the classical appearance of classrooms. Using technology in classrooms affects students' desire to spend more time in classrooms. But in technology-supported classrooms brightness ratio has found to be low in comparison to traditional classrooms because of the obligation to prevent light reflections. Lighting of the

classroom is an important factor for increasing the qualification of education. Taking this fact into account, in technology-supported classrooms curtains must be suitable for multipurpose use, architectural arrangements must be done considering the convenience of size and colors of windows and angle of incidence of light and lightening equipment must be controlled by more than one switch. In the research conducted by Cengizhan [19] it was found that in technology-supported classrooms no change for settlement arrangement could be made, classrooms were dark, lightening tools which were at the windows side, were controlled by a second switch only in the %36 percent of the classrooms, and %64 percent of classrooms had just one switch.

When it is evaluated in terms of plans and programs dimension of classroom management, results show that routines and stability in traditional classrooms continue to be exist in technology-supported classrooms too and teachers do not change methods they use during the course. Whereas using technology in education requires new learning-teaching techniques instead of classical methods. Technology-supported environments provide many opportunities for students such as making courses more attractive [20], making positive contribution for motivation, supporting teaching learning process, providing more participation in learning activities [21; 22; 23], contributing positively to interactive interaction [24], giving opportunity to take action on ready materials [25]. Despite these opportunities, teachers that use technology-supported environments still use more traditional methods. And this is an important barrier for increasing the qualification of education.

Students feel bored less in technology-supported classrooms. These classrooms are the places where students spend their times. And time is used more efficiently in technology-supported classrooms during the course. Course equipment is the greatest helpers of teachers; when they are used effectively, they provide advantages to teachers in terms of time management. It has also been found in researches of Averis, Door, Glover and Miller [26], Beauchamp, Jones, Kennewell and Tanner [27], Kayaduman, Sarıkaya and Seferoğlu [28], Bulut and Koçoğlu [29] that technology-supported environments make facilitating effect to the visual aspect of education, interactive interaction, do not bore students, provide time savings and help better and easier understanding. When it is considered that teachers can have more time to discover students' creativities and abilities, spend long and qualified time with students through effective time management [30] and effective time management provides economy for school management, teacher and students [31], it can be said that technology-supported classrooms make important contributions in terms of time management.

Using technology in education, decreases monotony by making the classroom environment enjoyable and funny. Teachers can motivate students and attract students' attention to the course more easily. By this way, they can provide vitality and attendance to the course and do not bore students. There is a parallelism with research results of Ermiş [32] in terms of those points; technology-supported environments contribute to students' motivation in a positive way, encourage teaching and learning process and provide more attendance to learning activities. In their researches Averis, Door, Glover ve Miller[26]Beauchamp, Jones, Kennewell ve Tanner [27], Kayaduman, Sarıkaya ve Seferoğlu [28], Bulut ve Koçoğlu [29] also got similar results about attendance, increase in communication and attracting students attention to course more easily. Also, in technology-supported classrooms students behave shy, teachers usually stand at the same point, do not move around the classroom and make presentations by looking at the slides on the interactive board. And these result as an important barrier for formation of relationship layout.

It has not been found any decrease in the frequency of occurrence of undesired behaviors in technology-supported classrooms. It has not been found any significant difference between the two groups. Decrease at shyness emotions of students is one of the advantages of technology-supported environments. The reason may be that teachers can motivate students more easily. Moreover it has been found that in technology-supported classrooms students are more willing to perform assigned tasks and do homework since they are concentric with technology and they are willing to benefit from technology in the classroom environment.

While equipping teaching environments with technology, efforts to make use of its advantages in education should be regarded. Furnishing classrooms with technological equipment of education will affect just physical variables. Despite the fact that physical equipment is effective, teachers should be conscious while using technology in classroom environments. Using technology effectively does not mean just having full knowledge of its hardware; it means using that hardware in the classroom environment in a manner that is convenient for existing conditions or in a manner that develops the conditions. The teacher should use technology to constitute a positive classroom environment. If the teacher uses technology in classroom environment in a perfunctory manner, this situation will become monotonous and will cause new classroom management problems. This situation will not be different from that of in a traditional classroom.

According to the research results, the following suggestions can be given;

1. When equipping classrooms with technology, arrangements should be done by considering physical variables of classroom management.
2. Teachers should be prompt to use the new methods and techniques to be used in technology-supported environments in their classrooms.
3. Teachers should be educated in the pre-service education as having acquired competence in the preparation of visual materials to contribute to time management in class.

4. Teachers should be trained in terms of effective presentation preparation and presentation techniques.
5. Teachers should be prompt to use technology effectively in the classrooms.
6. Teachers should be educated regularly on educational technology.

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Media with Captions and Description to Support Learning among Children with Sensory Disabilities

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Abstract The basis of this exploratory research was to study the benefits of using accessible media to enhance students from Hispanic origin with sensory disabilities' reading skills. A mixed method was used to explore the results of the use of captions and description in educational audiovisual content to enhance reading by increasing the vocabulary of students who are sensory disabled (Deaf-D/Hard of Hearing-HH or Visually Impaired-VI/Blind-B) and to motivate them to read by accessing media material. In the intervention teachers of the HH and of the VI/B explored the previous knowledge their students have on the topic presented, and following Discovery en la Escuela strategy for literacy acquisition using media, combined with accessibility features training, students were asked what they know and what they did not know about the video content. This piece aims to provide appropriate attention to the needs of children with sensory disabilities from Hispanic backgrounds through controlled strategies. Accessible media in Spanish to Hispanic students with hearing or visual challenges, open a new alternative to access information that otherwise is unavailable to them. Based on the results of this research study, it is recommended that teachers of students with sensory disabilities, and regular education teachers who have students with sensory disabilities in their classroom, be trained to use this strategy to provide equal access to the information taught.

Keywords Captions, Audio Description, Video Description, UDL, Accessibility, Sensory Disabilities, Deaf, Blind, Literacy

1. Introduction

Individuals with sensory disabilities encounter many challenges when accessing audiovisual materials, such as movies, television, Internet videos, and other media. The information in these media is presented in visual and auditory modes, precluding full access by those with visual or hearing disabilities. This reduced access to information limits the opportunities of people who have sensory disabilities to learn from educational media at a rate comparable to peers without visual or hearing disabilities, and puts schoolchildren at a notable disadvantage due to the increased use of audiovisual materials in the classroom.

The National Assessment of Educational Progress (NAEP) recently reported results of the 2015 reading assessments at grade 4 and 8, showing a large gap between students with and without disabilities. There is a need for interventions and practices to address the gap in reading performance between children with disabilities and their peers in the same grades. To design instructional strategies for effective reading for students with low incidence disabilities, such as deafness, blindness and deaf-blindness, and to enhance outcomes in their reading performance, it is imperative to consider their unique needs (Ferrell, Bruce, & Luckner, [1]. Individuals with sensory disabilities come from different cultural and linguistic backgrounds, including Hispanics who face additional educational barriers. "Hispanic students are the largest minority group in our nation's schools. But they face serious educational challenges that are hindering their ability to pursue the American dream. We must expand their educational opportunities at every level of the P–12 system to compete with the rest of the world" (Arne Duncan [2]. Educational challenges faced by the Hispanic community remain a major cause of lower academic performance compared to non-Hispanic students, as shown in the National Assessment of Educational Progress results (Hemphill, & Vanneman, [3]. Consequently, being Hispanic and having a sensory disability poses a greater challenge to students who are pursuing the American dream. Channels of communication of the Hispanic students are impaired due to a disruption of the language input by the hearing loss and using language that is not native to them. The VI/B students are also challenged by the limitation in their oral language

repertoire needed to understand written materials.

Students with sensory disabilities in Puerto Rico are also facing educational challenges in mastering their first language, Spanish. The Department of Education in Puerto Rico [4] has established a public policy to identify and provide special instruction to students with limited language skills in Spanish (Part A, Title III, ESEA, as amended & Carta Circular #25, 2016-2017. This policy also includes students from homes where Spanish is not the first language, who are struggling to master the Spanish skills needed to succeed in achieving the Core Standard adopted by the Puerto Rico Department of Education. The Executive Summary of the Medición y Evaluación para la Transformación Académica (META-PR- Measurement and Evaluation for Academic Transformation) for academic year 2016 presented the results of the test in Spanish for students in grades 5th, 6th, 7th, 8th and 11th. META-PR test is aligned to 2014 Puerto Rico Core Standards. The results showed that only 52% of students in the 5th grade performed at the Proficient or Advance (those that performed above the expected achievement) level. Those in the 6th, 7th, 8th, and 11th grades performed below 50% at the Proficient or Advanced levels. One can assume that among these are students who are hard of hearing or deaf (HH/D) and those who are visually impaired or blind (VI/B).

Technologies like captioning (CC) and Video Description (DV) are available to provide access to audiovisual materials for individuals with sensory disabilities. CC displays the audio portion of audiovisual material from a television program or other video source as text, allowing a D/HH person to access the audio information (Dicapta). DV is the narration of key visual elements from an audiovisual source so that people with visual disabilities can have access to the video information from television programs, movies, videos or any other type of audiovisual materials. Dicapta is a group of professionals who specialize in providing CC and DV services that allow access to audiovisual media (www.dicapta.com).

Packer, Vizenor, & Miele [5] analyzed and summarized the research studies on the benefits of DV. Their analysis showed that DV contributes to gains in knowledge and understanding of visual materials for students who have visual impairments. DV provided greater information retention, increased interest and enjoyment, better social connection, and increased knowledge about the visual world. For those who are HH/D, Newton & Dell [6] recommended that teachers include the technology of CC in their classroom because it benefits all students and enhances and supports the learning process for deaf students. CC guarantees access to information included in audiovisual materials that are used in schools.

As a complement to the teaching and learning experience, Strassman, MacDonald, & Wanko [7] suggested the use of digital technologies like television, the Internet, and applications like You Tube to enhance the acquisition of 21st century skills for all students. These skills include reading and writing. TV programs with CC and DV provide support to students who are HH/D or VI/B to increase their attention span, increase participation and provide them motivation to learn, among other benefits. Research has demonstrated that the use of CC improves vocabulary and enhances reading comprehension while providing access to cultural and academic experiences for students (Rowland; Jelinek & Jackson, [8-9]. Despite the benefits of the use of CC and DV for English-speaking students with sensory disabilities as reported in the literature, there is a lack of information about its effects on students with sensory disabilities whose first language is Spanish. There has, however, been research to show the positive effects of CC for non-disabled children whose first language is Spanish. Ferlazzo [10] for example, reported that ELL students benefit from videos with CC because it gives them the opportunity to compare their pronunciation in English while watching the written form. By repeating the audios on a regular basis, the ELL students gained confidence in the quality of their English and increased their willingness to participate in the ELL classes. Additionally, DV had been used successfully with students with cognitive disabilities as a tool to increase their vocabulary and foster their creative writing skills. Lectora [11] used digitized short stories with DV to teach reading and writing to her students with cognitive disabilities. The results showed that the students not only were able to answer questions about the stories, but also were also able to write descriptions for other short stories that they created.

2. The Intervention

This research was concentrated on the use of closed captions (CC) and video description (DV) in Spanish language audiovisual materials in classrooms in Puerto Rico where students who are D/HH or VI/B are placed, to respond to the learning challenges faced by students with sensory disabilities. Discovery en la Escuela authorized the use of their audiovisual materials and Dicapta inserted the CC and DV to the videos. The intervention focused on three aspects: 1) training of teachers in Discovery en la Escuela strategy to support learning (See Figure #1), 2) training for teachers in data collection for this intervention, and 3) appropriate attention to the needs of children with sensory disabilities from Hispanic backgrounds through alternating strategies.

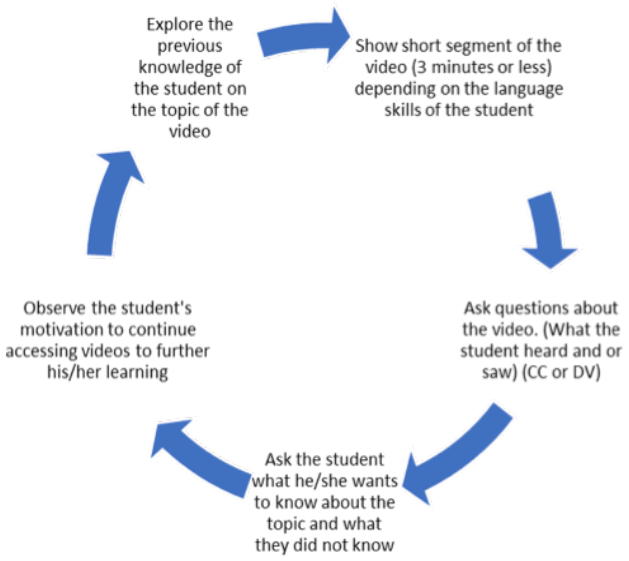

Figure 1. The Strategy Model

The Discovery en la Escuela strategy consists of the following steps: exploring the previous knowledge of the students by asking in advance what they know about the topics of a video they will later be shown; show a small segment (3 minutes) of the video; ask the students questions about what they saw or heard from the video and how it compares with what they knew; ask the student what else they want to know about the topic and what they do not know. The research team included accessibility to this strategy to be used with students with sensory disability. Discovery en la Escuela content will be shown with CC and DV.

When asked about what the students did not know, it gave the students the opportunity to revise what they knew about the topic with the new information acquired and determine what they have learned. For example, the students talked about what they know about elephants; after watching a video one student learned that there were two different kinds of elephants, not only one as he thought. This procedure continues until the end of the video. The teacher advances the video and controls its pace to respond to the students' language skills. While teachers and students talk to each other while listening to (DV) or reading (CC) the video, the students are supposed to confirm their previous knowledge and acquire new information on the topic at a pace that is manageable for them. Opinions from the teacher collected before the intervention will provide teacher's perceptions of what the benefits might be, and the post-intervention opinions will provide teacher views based on their experience acquired during the implementation.

Hence, the intervention is expected to foster the students' motivation to continue watching the videos while reading and acquiring new vocabulary. Inserting CC and DV in the media make the material accessible not only to students with sensory disabilities but to all learners. As designed, this strategy meets the universal design for learning (UDL [12] principle as it could be used by all learners, it is flexible to accommodate individual preferences, and it is simple and easy to understand by all learners including those with sensory disabilities (Ralabate; Rose, & Gravel; Mice, [13, 14, 15]. According to the first principle for an effective UDL, multiple means of representation should be part of the design. Using captions to represent the audio content and descriptions to represent the visual element in educational media content assures that multiple possibilities are presented to the students in the classroom to acquire aural and visual information.

2.1. Methodology

The research questions that directed this study were:

- What are the benefits of the systematic strategy of using media with CC and DV for Discovery en la Escuela content in the acquisition of information and the development of vocabulary in Spanish for students with sensory disabilities?
- Whether the exposure to media with CC and DV in Spanish enhances reading skills by increasing the vocabulary of students who are D/HH or VI/B?
- Whether the exposure to media with CC and DV in Spanish enhances the motivation to read of Spanish-speaking students who are deaf or blind

2.2. Content

Teachers were given access to the accessible audiovisual content provided by Discovery en la Escuela through its website http://discoveryenlaescuela.com/adccvideos or through DVDs with the accessible content (with CC and DV), authorized by the content provider, in some of the schools without Internet access.

Accessibility features (CC and DV) were activated by the teachers at the website. Accessibility features were also available using second screen technology though a technology provided by UC3M. Teachers were instructed in synchronizing the audio of the original video clips with CC and DV to be utilized as an alternative.

A mixed method was used in this study to explore the benefits of the use of CC and DV in audiovisual material from Discovery en la Escuela to enhance reading by increasing the vocabulary of students who are sensory disabled (D/HH or VI/B) and to motivate them to read by accessing audiovisual material with CC and VD. A mixed method allows the researchers to gather and analyze both quantitative and qualitative data. According to Zuleta Moreno [16] mixed research is a group of systematic, empirical, and critical research processes in which the data collection and analysis uses qualitative and quantitative methods to achieve a better understanding of the phenomenon studied.

Teachers of students with sensory disabilities were asked their opinions on the possible benefits of the intervention

before and after the implementation. The opinion of teachers was obtained through a questionnaire with multiple-choice questions and open-ended questions. The sample was a small one; and as such the data collected was not suitable to statistical analysis, other than frequency analysis.

2.3. Participants

A group of twelve (12) teachers were invited to participate; six were teachers of students who are D/HH and six were teachers of students who are VI/B. Each of six teachers per category was randomly assigned to participate in groups of three. The 12 teachers were selected from the Puerto Rico Department of Education (PRDE) located in different schools throughout the island and from a private school for deaf students who voluntarily agreed to participate in the study. Each teacher participant was assigned a letter (A to L) to protect his or her confidentiality.

The criteria to participate in the study were being a teacher of students who was D/HH or VI/B at the fifth grade or above. Their students should be initiated in reading in Spanish. In other words, Initiated reading level is when the student decodes the words and can explain simple questions like what, how, who. Both the PRDE and the private school authorized the participation of their teachers. Although an effort was made to include an equal number of male and female participants, all participants in this study were female. Based on the research protocol authorized by the University of Puerto Rico-Rio Piedras^ (UPRRP) Institutional Review Board (IRB), the 12 teachers received an explanation of the scope of the research, the purpose, the risks and a summary of what was expected from them as voluntary participants. Each signed a consent form agreeing to participate in either the control or the experimental group. After that, teachers were asked to get parental authorization to allow their children to be exposed to the strategy. They also obtained students' agreement to participate in the strategy.

The teacher questionnaire was developed by the principal researcher and project director and validated by two experts in the field. The experts were given the research questions and were asked to determine if the questionnaire, as designed, would provide the information needed to answer the research questions. This instrument was used to obtain the opinions of the participants regarding the benefits of media with CC and VD in reading skills through vocabulary development and motivation to read for their students with sensory disabilities. The first part of the questionnaire asked about demographics of the participants such teachers' highest level of education, years of experience, type of sensory disability of their student(s). In the second part, there were six multiple choice questions about their students' grade level and reading level, their motivation to use CC or VD, the frequency with which they access media with either CC or VD and if the content area(s) that they taught were appropriate for using media with CC or VD. There were two open-ended questions: how beneficial was the strategy in fostering reading skills of their students and how it stimulates their motivation to read. The second open question asked the participants recommendations on how to train other teachers of sensory disabilities in the use of the strategy. Table #1-A summarizes the demographic characteristics of participants.

Most of the participants had more than 10 years of experience teaching students with sensory disabilities. All of them were trained to teach students with sensory disabilities, Deaf Education, or Visually Impaired Education.

Teachers reported that all the participating students had little or no experience with CC or DV.

In Table #2-A and #2-B there is a summary of the characteristics of the students and teachers who participated in the intervention.

2.4. Procedure

Each participant was interviewed by the researcher in their classroom and asked to sign a consent form before they answered the questionnaire. This procedure was done prior to the implementation of the strategy. Participants were also asked to get consent from the parents of students who would be exposed to the strategy. The students' agreement of the experience was also required. Each teacher prepared a schedule to meet with the researcher every two (2) weeks for follow up on the implementation of the strategy. They were asked to implement the strategy at least once a week for 45 minutes, for eight weeks. With the assistance of the principal researcher, teachers selected the appropriate video to match the content area in which they implement the strategy. Teachers prepared a vocabulary test based on the lesson taught using the selected video with CC and DV, and were instructed to test the students every two weeks on the new vocabulary and prior to seeing any of the videos. In addition, teachers were instructed to observe changes in students' attitudes toward reading.

Teachers were trained on the strategy prior to the implementation of the intervention in collaboration with the Director of Discovery en la Escuela and the Project Director. Each teacher received a tablet and a videodisk with three videos with CC and VD from Discovery en la Escuela. In training, it was modeled to the teachers how to explore the previous knowledge their students with sensory disabilities have on the topic presented in the video with CC and VD; how to questions the students about what they would like to know about a topic and after viewing a part of the video; then ask students what they did not know about it. For example, after watching the video on the elephants, they may realize that despite the information they had, they acquired new information on the subject, e.g., what the name was of the sound that the elephants made. Participation was encouraged during the training. Teachers were instructed in using second

screen technology provided by UC3M using the tablet received to synchronize the audio of the original video clips with CC and DV.

Teachers were asked to register in Discovery en la Escuela to download materials and the Activities Guide that is available online. The researcher then discussed how the teachers will select the content area and how to use it the content area of the Puerto Rico Core Standards provided by the Department of Education in Puerto Rico that they are teaching. The strategy was implemented for eight weeks.

Table 1A. Demographic Data of Participants

Teacher	HH/D	HH/D	HH/D	VI/B	VI/B	VI/B
Code	A	B	C	D	E	F
Years of Experience teaching	2	15	14	20	15	13
Highest degree	BA/Deaf Ed	BA+15 cred in Sp.Ed	BA in Sp.Ed.	MA VI ed.	BA+MA in Sp.Ed.	BA in VI Ed.
Students grade level	5th	5th	6th (1) 7th (1)	12th (1)	7th (1)	6th (2)
Students' experience with CC or DV**	Novice CC	Novice CC	Novice CC	Novice DV	Novice DV	Novice DV
(All participants were female, teachers of the VI/B did not have experience with DV before the study)						

Table 2A. Students who are Hearing Impaired/Deaf who participated in the Intervention

Teacher	Age Of The Student(S)	Grade / Reading Level**	Motivation Of Student To Use Audiovisual Material With CC (Before/After)	How Independently The Student Accesses Audiovisual Material With CC (Before/After)
A	11	5TH / Initiated in reading	Poorly motivated/ Very motivated	Needs a lot of help / Needs no help
	12	6TH / Initiated in reading	Poorly motivated/ Very motivated	Needs a lot of help/ Needs some help
B	10	5TH / Initiated in reading	Motivated/ Very motivated	Needs some help/ Needs some help
C	11	6th / Initiated in reading	Somewhat motivated/ Somewhat motivated	Needs some help/ Needs some help
	15	7th / average reading	Somewhat motivated/ Motivated	Needs help/ Needs help

Table 2B. Students who are Visually Impaired/Blind who participated in the Intervention

Teacher	Age Of The Student(S)	Grade / Reading Level	Motivation Of Student To Use Audiovisual Material With DV(Before/After)	How Independently The Student Accesses Audiovisual Material With DV* (Before/After)
D	17	12th / average reading	Motivated/ Very motivated	Needs some help/ Needs some help
E	12	7th / 7th grade reading level*	Motivated/ Very motivated	Need no help/ Need no help
F	11	6th / initiated in reading	Motivated/ Very motivated	Needs some help/ Needs some help
	12	6th / initiated in reading	Motivated/ Very motivated	Needs a lot of help/ Needs a lot of help

2.5. Results

Answers to the research questions are presented below. To answer Research Question #1, the responses of the open questions from the questionnaire are analyzed.

- Question #1: What are the benefits of the systematic strategy of using media with CC and DV for Discovery en la Escuela content in the acquisition of information and the development of vocabulary in Spanish for students with sensory disabilities?

To answer this question, teachers' responses to the same questionnaire before and after the implementation were compared. One of the open questions in the questionnaire asked teachers' opinions on how the use of CC or DV and the strategy fosters students' reading skills and motivation to read.

One of the teachers commented, "the strategy fosters reading skills because the student acquires new vocabulary". In the vocabulary quizzes, the student demonstrated the acquisition of the new vocabulary that was included in the videos used for the intervention. The teacher added, "the videos with CC gave the D/HH student the opportunity to read while observing the visual images". She reported that her student improved oral reading skills and was motivated to participate in class after the intervention.

Teacher C who worked with three (3) HH students who benefit from their residual hearing, benefited from the audio of the programs. She expressed that "the strategy benefitted her students because it challenged them to use their residual hearing, while giving a visual image of what they were reading". She added: "my students with residual hearing benefitted from DV, as well, because it supports their independence in accessing the information that they are seeking; and as such, it will motivate them to explore the world of information and knowledge". Moreover, she considered that the three modes (CC, visuals, and audio) presented simultaneously in the video help the students to integrate the information presented and enhance their comprehension of the topic. The teacher added "the strategy stimulated their motivation and curiosity to continue watching the videos. The different ways in which the information is presented in the videos enriches their vocabulary, their knowledge and perception of the world that they were not aware of ". The vocabulary quizzes showed how they were integrating the information with their personal experiences. For example, they compared the way they relate to other peers with the way elephants interact in their community. They also could relate the information to other content area like Mathematics.

Teachers of the VI/B responses to open question #1 prior to the implementation of the strategy were based on what they thought the strategy might have been. None of these teachers have had experience-using DV in their classroom. Their responses to the questionnaire after the intervention were even more positive and based on their experience with DV. Teacher D expressed that "the strategy fosters my student's reading skills and motivation to read because the audio feedback of the DV and her tactile skills supported her effort to achieve the academic skills at her grade level. All her senses are stimulated with the DV and helped her to concentrate on the tasks that she works on in the classroom. Teacher E commented, "DV provides a total learning experience to her student". Teacher F commented that during the initial session, her student with very low vision was so surprised with the DV because it was the first time that she could understand what was displayed on the screen. After each session, she could describe in her own words what was described in the video. "It fully captured her attention", Teacher E said.

- Question #2: Whether the exposure to media with CC and DV in Spanish enhances reading skills by increasing the vocabulary of students who are D/HH or VI/B?

The teachers of the HH/D answered the pre-questionnaire based on what they thought of CC, as it relates to their personal experience watching CC in movies, but not as the result of using it as a teaching tool. They also expressed in the pre-questionnaire that the only time that their HH/D students were exposed to CC was when they go to the movies. Movies shown in most theaters in Puerto Rico are in English with CC in Spanish or are dubbed in Spanish for the general audience who do not speak English. Local TV channels in Puerto Rico have their programs in Spanish as well with no CC, unless it is activated. They thought that videos with CC could help their students to increase their reading level, but had never used the technology as a teaching tool before.

After implementation of the strategy, teachers of students who are HH/D reported that the strategy fosters the acquisition of new vocabulary, which in turn helps enhance the reading skills of the students. Teachers of the HH/D in this study had not previously used material with CC to teach their students. Teacher B, for example, did not have access to the Internet nor videos with CC prior to her participation in the study. Teacher C has used materials with CC, but for recreational purposes, not to teach new vocabulary. For teacher A, the CC was not useful to teach reading to her students. She said that depending on how the CC is used, it may help her students to acquire vocabulary, but that sign language was a better means to understand what she read to them. She used signs and oral Spanish to teach reading to her students.

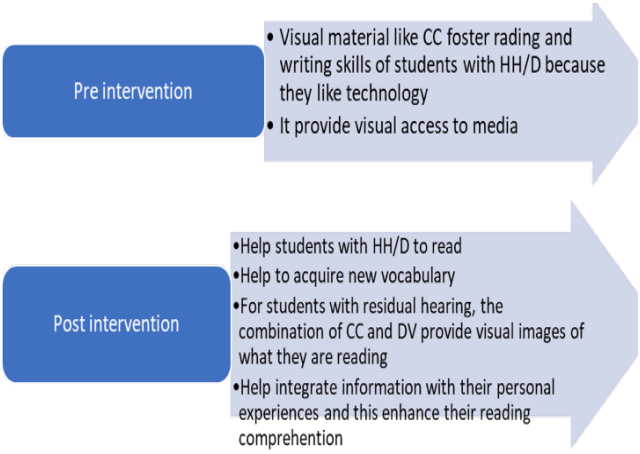

Figure 2. Responses of teachers for the HH/D. Increasing reading skills by acquiring new vocabulary

The teachers of VI/B students answered in the pre-intervention questionnaire that DV could help their students enhance their academic achievement. They consider that media with DV could be used as a complementary technique to teach vocabulary. As mentioned before, these teachers had little or no experience using DV in their classrooms. However, after the implementation, the three teachers of the VI/B students agreed that the DV fostered the development of reading skills in their students. Also, Teacher D said the descriptions helped her students with residual hearing improve the use of the hearing input. Hearing the description helped them to understand the visual images on screen. Teacher F also agreed that one of the students with whom she used the strategy had low vision and could see the CC; along with the DV he could confirm what he was watching on the screen. For her other student, whose vision was very low, the DV alone helped her to understand the visual information on the screen.

- Question #3: Whether the exposure to media with CC and DV in Spanish enhances the motivation to read of Spanish-speaking students who are deaf or blind?

Unanimously, all the teachers considered that the CC and DV would motivate their students to read and to watch media. Teachers of HH/D students answered before the implementation of the strategy that the CC could help motivate their students to read. After using the strategy, teachers of the HH/D were more convinced that their students were motivated to read and to watch videos with CC. Their students asked their teachers to provide them with other videos with CC, a reaction that they had never had before, although they watched movies with CC before.

Before the intervention, teachers of the VI/B also thought DV could motivate their students to read. After the intervention, the three teachers were overwhelmed by how much DV motivated their students to read and to access videos with DV. Teacher F commented that her student with low vision was so surprised when she first heard DV that her face "glowed". She was motivated to talk more about the topic of the video. Teacher D's opinion was that the DV stimulated her student's senses and this motivated her to read and to access other videos with DV. For Teacher E, the technology motivated her student to integrate DV in her learning process.

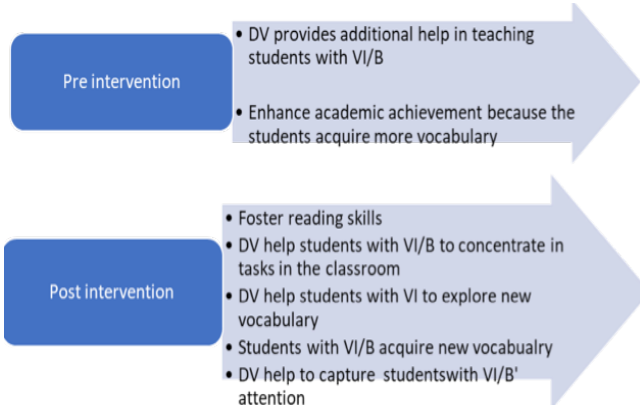

Figure 3. Responses of teachers for the VI/B. Increasing reading skills by acquiring new vocabulary

3. Discussion

The purpose of this mixed method exploratory research was to study the benefits of the use of a systematic strategy to use media with CC and DV to enhance students' reading skills by enhancing the vocabulary of students who are HH/D or VI/B and to examine whether it motivated them to read. The study aimed to get teachers' opinions before and after training and implementation of the strategy with their students with sensory disabilities. The strategy taught them to use questions to explore the previous knowledge of their students on the topics addressed in the videos from Discovery en la Escuela with CC and DV. An important aspect of the strategy is that the videos were presented in short segments that allowed the teachers to control the pace of the video and adjust it to match their students' linguistic skills. They also used questions to explore what the students learned and what they did not know about the topic. After the implementation for eight weeks, teachers had gained the experience to express their opinion on the benefits of the strategy on their students' reading skills by increasing their vocabulary and motivation to read. Prior to the training and intervention, teachers thought that the intervention could foster the acquisition of new vocabulary and the motivation to read in their students, though none of them had used videos with DV in the past to teach their students. Similarly, teachers for the HH/D also thought that the use of CC was beneficial to their HH/Deaf students, yet they lack the experience of using media with CC to teach content. They used videos with CC for recreational purposes only.

After implementing the strategy, two major changes occurred in students' vocabulary and motivation to read. The vocabulary of the students regarding the topics of the videos expanded significantly. For example, one of the videos from

Discovery en la Escuela that was used in the intervention focused on elephants. Before the intervention, students described some characteristics such as elephants' size, trunk, and ears. After watching/listening to the video they could describe other characteristics, such as the habitat where they live, their "community", the two types of elephants, and where they came from. The students could make comparisons based on the elephants' size and shapes, using the appropriate vocabulary.

The teachers of the HH/D expressed that the CC helped their students to understand the videos and were motivated to further explore the topic. They were also motivated to watch other videos with CC to get information on additional topics. The teachers said that some of the students were more confident to talk in class to share their knowledge with their classmates. The students with HH/D who were beginner readers benefitted from the short periods that the video was shown in because it helped them to read the CC. The picture and the CC on the screen help the HH/D students understand the information presented.

Jensema, Sharkawy, Danturthi, Burch, & Hsu [17] found that videos with CC help students who are HH/D from English speaking backgrounds with poor reading skills because it provides information to understand the content of what they are watching. Jelinek & Jackson [9] also established that CC assists the HH/D student to understand better what is on a video. For the teachers of the VI/B, the DV was of great assistance for students with low vision, because the descriptions helped them to understand the images on the screen. (Note that all the students selected by the teachers of the VI/B had low vision.) The students could corroborate what they were watching on the screen with the descriptions. One of the students with low vision could understand the visual information with the aid of the DV. The auditory experience provided by the DV impacted them positively and increased their satisfaction and motivation to continue watching videos with DV.

Previous studies on the use of DV in media in English had shown that all students, including those with visual impairments, who are exposed to this technology, increased their attention and reading and writing skills, as well as their motivation to read (Hoffner, Baker, & Quinn, [18]. In a paper on the discursive process of DV, Piety [19] reported that Frazier's 1975 thesis demonstrated that audio information enhanced the comprehension of the VI/B person. Fine, Labianca, & Peli [20] found that DV helped people with low vision and blindness to get details of the visual content of a video. Furthermore, Kirchner & Schmeidler [21] found that DV was beneficial to VI/B persons because it increased the amount of information understood in a video. They added that participants found the videos interesting as well as informative, which in turn had a positive impact on the users.

Teachers of the VI/B in this study found that the DV in the videos from Discovery en la Escuela impacted their students positively, not only because it was accessible to them, but for the additional information that it provided on the topics. It gave students the opportunity to get a better "picture" from the screen, which enhanced their understanding and motivated them to continue accessing videos with DV. Also, the teachers of the VI/B as well as those of the HH/D students from this study who implemented the strategy agreed that the use of DV or CC helped their students to acquire new vocabulary and motivated them to read.

The results of this exploratory research show that videos with DV and CC used systematically with questions to guide access to this media, foster the acquisition of new vocabulary in students with sensory disabilities from Spanish speaking backgrounds and motivates them to read. The questions about what they knew, what they did not know, and what they have learned that accompanied the watching/listening of the audiovisual material with CC or DV, guided the students to pay attention to details that otherwise would not be considered in understanding the topic of the video. These results are supported by previous studies with students with sensory disabilities from English speaking backgrounds.

The explanation for these results may be that DV and CC provide alternatives that compensate for the child's sensory loss. DV fills the need for the limitation in the visual channel. The auditory channel receives pertinent information to cope with the missing of the visual sense. Likewise, with CC, the visual information compensates for the auditory channel that was missing due to deafness. When teachers presented videos with CC and DV at the linguistic level of the student, whether in the visual or aural mode, it gave students the stimuli to increase attention, enabling them to understand the information presented. Additionally, the questioning regarding previous knowledge alerts them to concentrate on the visual and auditory input to confirm or reject their knowledge. As one of the teachers said, the videos with DV and/or with CC stimulate all the senses that the student has available and so they can use them to their benefit.

Analysis of the results from this mixed method research shed some light on the benefits that accessibility using CC and DV provide to students with sensory disabilities from Hispanic backgrounds.

First, when media with CC and or DV is available in Spanish to Hispanic students with hearing or visual challenges, it opens a new alternative for them to access information that otherwise is unavailable to them. When teachers are trained to use this technology and to control its pace, it guarantees that the students with sensory disabilities grasp the information because it is not above their linguistic capacity.

Second, the use of CC or DV facilitates the acquisition of new vocabulary that enables students with hearing or visual challenges to understand and to connect the information to previous knowledge, which can then be generalized to other content areas and in other contexts.

Third, in the case of students with VI/B, the video descriptions stimulate their hearing comprehension, which serves as a scaffold to oral reading comprehension. In the case of students with HH/D the visual access that CC

provides is a scaffold to integrate not only new vocabulary but the correct syntax rules of the Spanish language that they need to write.

Fourth, the combined technologies of CC and DV provide double exposure, visually and aural, to students who have residual hearing and residual vision. Input from two channels facilitates the corroboration of information that they receive through vision and hearing, despite the sensory loss. That was the experience of one of the students with low vision. The audio description helped her to understand what she was watching on the screen. When the technology of CC and DV is available to students and it is available at their linguistic level, they are motivated to search for new knowledge.

Considering the universal access to information that the videos with CC and DV provide to students with sensory disabilities and the questions that guided the experience in the classroom, the benefit of the strategy seems to be the result of the intertwine of the technology of CC and DV and the questioning process studied. Without the access to the content presented in the video, students were not able to respond to questions posed by the teachers.

4. Implications and Recommendations

Because of these mixed method research results, it is recommended that teachers of students with sensory disabilities, and regular education teachers who have students with sensory disabilities in their classroom, be trained to use this strategy to provide equal access to the information taught. Since this is a universal design teaching strategy it is accessible and beneficial to all students and nurtures an inclusive environment in any classroom. Teachers are not forced to create additional alternative activities for students with sensory disabilities.

Analysis of the impact of using new technology in the classroom as part of the strategy for inclusion is recommended for further research.

Discovery en la Escuela should include CC and DV in all their TV programs because Hispanic families, even those who do not have sensory disabilities, will benefit from the technology, which may help their children who are struggling with language skills in Spanish.

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Science Instruction through the Game and Physical Activities Course: An Interdisciplinary Teaching Practice

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Abstract The purpose of this study was to examine the effect of science instruction given through the game and physical activities course in accordance with interdisciplinary teaching approaches on students' science achievement and retention. The participants were 82 third grade students from a public elementary school. Three classes were chosen as experimental groups and one class was chosen as a control group in the school. The instruction period lasted for five weeks in all groups. The data were collected by an achievement test and an education portal achievement (EPA) test. The pretest-posttest control group design was used in the study. Data obtained from the tests were analyzed through one-way analysis of variance and post-hoc analyses. The findings indicated that some of the experimental groups were more successful than the control group with large effect sizes. The results suggested that the game and physical activities course incorporating interdisciplinary teaching approaches could be used in increasing students' science achievement and retention of science knowledge.

Keywords Interdisciplinary Teaching, Science Education, Game and Physical Activities, Elementary School, Achievement

1. Introduction

Physical education is a critical part of learning. Movement experiences have many benefits for children. They exercise the whole body, including the mind and not just the muscles; the exercise can help the children to develop a lifetime desire for health, fitness and success in all areas of academic learning [1]. Beyond that, for children, movement is certainly joyous. Moreover, studies of how young children learn have proven that they especially acquire knowledge experientially—through play experimentation, exploration, and discovery. Today's emerging research on the brain shows this to be true that there is indeed a link between moving and learning [2]. Movement allows children to be more confident of their own skills, while contributing to their success because of their self-confidence and self-respecting experience. In this context, physical education in primary school level is a very important course for the cognitive development of children, because children can learn other disciplines such as science, mathematics, social science, language, art and music through physical education.

It is possible to have some scientific experience through physical education, which is the subject of this paper. It is necessary to implement interdisciplinary teaching in order to benefit from these possibilities. Interdisciplinary teaching has been applied to physical education in subject areas such as science, reading, dance and art [3-4]. The value of interdisciplinary teaching in physical education is that it enables children to use their strengths and existing knowledge, which may encourage children who are not as easily engaged in physical activities to participate more actively [5]. In this regard, it is stated that there is a need for an interdisciplinary teaching environment in which students are equipped with theoretical knowledge through extracurricular activities, and which can be implemented in a class considering individual differences, or outside the class [3]. This is because interdisciplinary teaching is an approach that tells us to focus on the problem by bringing together our knowledge and skills in the solution of problems encountered in daily life [6]. In other words, the problems that is encountered is tried to be solved by using together all pieces of knowledge gained without questioning how much mathematics, physics or geography is needed to solve such problems. As teaching students multifaceted thinking skills, interdisciplinary teaching provides them more real-life like learning environments [7]. Therefore, it is thought that interdisciplinary teaching approach can be beneficial for experiential science education that has equivalence in real life. In the literature, it is suggested that there is a need for interdisciplinary learning environments that enables practicing learned science concepts in the class or outside the school [4-8-9-10-11]. Based on this suggestion, in this study, an interdisciplinary learning environment was designed from the perspective of the game and physical activities course that has an important place for elementary school students in

a way that is fun, experiential, active and that can associate the concepts of the science course to daily life, and the effects of this environment was examined.

Game and Physical Activities (GPA) Course and Science Education

The GPA course is conducted in elementary school since 2012, in Turkey. This course is game based physical education. The GPA course can be argued to be one of the most natural ways for putting science principles and concepts into practice. This is because the GPA course naturally includes cases of desire to play games, enjoying games, and being physically active, which are observed intensely in elementary school children. Besides, most of elementary school children's time passes with games and moving around.

From the perspective of children's development areas, games are of great important as well. Games are positively related to children's cognitive, psychomotor, social, affective and language development areas [12]. In addition, games create a valuable learning atmosphere for children. While playing games, their attention, interest, curiosity and desire are all automatically active, and their imagination and creativity develop. Games enable children to learn basic science concepts whereas giving them the opportunity to express their feelings and energy freely [13].

Even if the information is presented to students by establishing connections from students' daily life in a way that attracts their attention, it is not usually possible for children to experience those pieces of information. However, science subjects include many activities that are actually experienced in daily life. In the literature, there are studies in which science subjects such as force and motion, muscle and skeletal structure, the Newton laws, simple machines, and operation of body systems are taught by means of physical activities. In these studies, it is seen that the science teaching based on physical activities is usually done using the basic arguments of the physical education course [9-10-11-14-15-16-17]. In other words, science teaching was done through characteristics of physical skills such as in volleyball, football, or jumping. These studies were conducted mostly at middle school and high school levels. Besides, in this study, considering that science teaching merely based on physical activities would be far from fun at elementary school level, an interdisciplinary science teaching was designed by using games in the science course in accordance with the content of the GPA course. This aspect stands out as the difference of this study from others in the literature. In this way, it is thought that an active, participating, fun and real-life like science teaching could be presented to children of elementary school age as the period in which they need physical activity at most. Moreover, in the literature, there was no clear explanation on when to introduce science concepts while students engage with the GPA, i.e. before the GPA, during the GPA, or after the GPA. For this reason, in this study, we aimed to develop three treatments that take into account timing of introduction of science concepts while students conduct the GPA. In this regard, the research question addressed in the study was "What is the effect of three types of science instruction done with an interdisciplinary teaching approach based on the GPA course on students' academic achievement in science and retention of science knowledge?"

2. Method

Research Design

The study was designed based on the pretest-posttest quasi-experimental model with a control group. It was conducted within the scope of the unit "Let's Learn About Force" included in the elementary 3rd grade science course in the 2014-2015 school year.

Population and Sample

The population of the study is the third grade elementary students aged about nine years old in Şarhöyük education zone of the Tepebaşı District Directorate of National Education in Eskişehir province in Turkey. This education zone generally has students with medium and low academic achievement. There are eight elementary schools in this education zone. Four of these schools were not included in the population because they provided education in multi-grade classes, and the remaining 4 schools and 361 third grade students in 16 classes in these schools were determined as the accessible population. All third grades in four classes in one of these elementary schools selected through convenience sampling method constituted the sample of the study (n=82) that was nearly 23% of the accessible population. The distribution of the students based on groups and gender is presented in Table 1. In the table, the groups in which the science concepts were taught at the beginning of, during, or at the end of the activities were listed as "Experiment 1", "Experiment 2", and "Experiment 3", respectively.

Table 1. Distribution of participants based on groups and gender

Groups	Male	Female	Frequency (*f*)	Percentage (%)
Control	7	11	18	22.0
Experiment 1	8	14	22	26.8
Experiment 2	7	14	21	25.6
Experiment 3	7	14	21	25.6
Total	29	53	82	100.0

The socioeconomic level of the families in this population was generally low. The environment of the students can be described as the suburban area. Considering the variables of the study, and the school administrators' and teachers' statements, there was no sign of a difference revealed

between the students in the sample and those in the rest of the population. Therefore, it can be argued that the findings obtained with the sample can be generalizable to the population. On the other hand, the practices in the experimental groups were implemented in the school garden with a basketball hoop and lines, and different game materials. The generalizability of the results to the population can only be valid if these physical conditions are met.

Pilot Study

A pilot study was conducted before the actual implementation to see the functioning of the activities. In the pilot study, which aimed to teach the unit "Let's Learn about Force" of the third grade science course based on the GPA course, eight game-based physical activity plans were firstly prepared, and applied with 36 students. It was observed that the emphasis of competition is important in preparing this kind of activities, and game rules should be easily comprehended by students. Another important feedback received from the pilot study was that students do not want to continue the lesson in the class after playing outside to talk about science concepts. The new activities and lesson plans used in the actual implementation were designed in light of these pieces of feedback.

Data Collection Tools

Achievement Test

A multiple-choice pretest consisting of 16 items and a posttest with the same number of items parallel to this pretest were developed to be used in the pilot study with regard to the outcomes of the unit "Let's Learn about Force" in the third grade science course. These tests were employed to see whether the activities applied in the pilot study contributed to the students' learning. The questions were enriched with examples from daily life. A new 16-item achievement test was formed based on the feedback received from the students related to the 32 items in total used as pretest and posttest in the pilot study in terms of question root, intelligibility of options, and easiness/difficulty. This test was administered to 152 elementary 3rd graders for validity and reliability analyses. ITEMAN, an item and test analysis program was used to analyse each item. As a result of the analyses, the Cronbach's Alpha reliability coefficient was found as 0,69. The item difficulty mean was 0,51 and the item discrimination mean was 0,53. Following the analyses, it was decided to revise some of the items. One item was discarded because of its low item difficulty level. The alternatives of one easy item were revised so that its difficulty level would be increased. The stem and alternatives of three difficult questions were revised in order to make their difficulty level medium. Consequently, the multiple-choice achievement test consisting of 15 items was finalised. The test was examined by a physics education expert in terms of scientific accuracy by means of the table of specifications in Table 2, and its content validity was ensured. It was used as the pretest, posttest, and retention test, which was administered six months after the posttest, without any change.

Table 2. Table of specifications for the achievement test

	Outcome Level						Question	
Topic	Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation	Percentage (%)	Total(f)
Acceleration, Deceleration, Turning, Swinging and Deflection		1					26.6	4
Push and Pull Forces		2					26.6	4
Force, Push and Pull Forces		3					26.6	4
Moving and stopping objects		4					20	3

The numbers shown in Table 2 under the title outcome level are the numbers assigned to the outcomes (see Table 6). The Cronbach's Alpha value, and item difficulty and item discrimination mean values for the pretest, posttest and retention test are presented in Table 3. Accordingly, it can be argued that the achievement tests were reliable, and the items were discriminatory [18]. It can be stated that the test was difficult in the pretest administration, whereas it was easy in the posttest and retention test administrations. This is expected as a result of instruction. A sample question from the achievement test is given in Table 4.

Table 3. Item and reliability values for the achievement pretest, posttest and retention test

Achievement Test	Cronbach's Alpha	Item Difficulty Mean	Item Discrimination Mean
Pretest	,66	,53	,55
Posttest	,62	,77	,53
Retention	,63	,74	,62

Table 4. Sample questions from the achievement and EPA tests

Test	Sample question
Achievement test	If we let a supermarket car downhill, what kind of motion does it have? A. Motion with increasing speed B. Motion with decreasing speed C. Swinging motion
EPA Test	Which one of the following have a motion with increasing speed? A. A bus approaching the bus stop B. A ship approaching the port C. An airplane taking off

Educational Portal Achievement Test (EPA test)

In the control group, a web-based educational portal, which was free for all teachers, was frequently used for lecturing and various assessment practices. Since this portal included end-of-unit tests, a new test, called the EPA Test, including 15 multiple-choice items was prepared by the researchers by selecting questions from these tests, and its content validity was ensured through an examination in terms of scientific accuracy by means of the table of specifications presented in Table 2. The purpose of using this test was to see the level of achievement across the experimental groups in the end-of-unit tests appeared in the instructional materials of the control group. In this way, an alternative step was taken against a possible bias by the researchers in favour of the experimental groups in the process of developing the achievement test. It was decided to administer this test to all groups after the instruction and as a retention test six months later. The Cronbach's Alpha value, and item difficulty and item discrimination mean values for the EPA tests are presented in Table 5.

Table 5. Item and reliability values for the EPA tests

EPA	Cronbach's Alpha	Item Difficulty Mean	Item Discrimination Mean
Post-Instruction	,60	,68	,45
Retention Test	,67	,79	,48

Based on these values, it can be stated that the test was reliable, discriminatory and slightly easy [19]. The test was actually expected to be easy because it was administered right after the students finished the unit. A sample question from the EPA test is given in Table 4.

Experimental Procedure

The treatment developed in this study was to teach students science through an interdisciplinary approach with the help of the GPA course. Three strategies were generated to deliver the treatment in the experimental groups. The difference between the strategies was the timing of introduction of science concepts while students conduct GPAs. The classes 3-A, 3-C and 3-D were the experimental groups, while the class 3-B was the control group. Each class was taught by only one elementary school teacher who are responsible to teach many courses. The teachers voluntarily decided which group (experimental or control) they will be. Based on which strategy the experimental groups would be taught was determined by random selection. Accordingly, it was planned that the science concepts would be presented during the activities in 3-A, at the beginning of the activities in 3-C, and at the end of the activities in 3-D. The GPA-based experimental procedure and the control group instruction were implemented only in the science course hours that were three hours in a week. The experimental procedure lasted in five weeks. Before the treatments, students were given the achievement test as a pretest. After the treatments, students were administered the achievement test and the EPA test as posttest. Six months later those tests were administered as a retention test. Different teachers in each class would possibly affect or change the target treatments because of their personal or professional characteristics. In order to minimize this effect, before the implementation, the teachers of the experimental groups were told in detail how the lessons would be delivered on sample lesson plans. Any confusion that the teachers had was eliminated. On the other hand, the teacher of the control group was asked to deliver the lessons as usual. Moreover, all classes were observed by an observer through completing a checklist in order to see if the teachers followed their lesson plans or done different things apart from the lesson plans due to their characteristics. Thus, we were able to understand if the teacher characteristics interfered with the treatments.

Developing Interdisciplinary Lesson Plans

When the third grade curricula of the science and GPA courses were examined, it was seen that the outcomes of the unit "Let's Learn about Force" in the science course, and those of the GPA course were compatible. These outcomes are presented in Table 6.

In the literature, the interdisciplinary teaching approach does not have a single understanding. Particularly within the scope of integrated curriculum, the term 'interdisciplinary' is frequently used as a curriculum model [19- 20-21]. In this study, it is thought that student outcomes related to force and motion can be taught to students through the GPA course based on Placek and O'sullivan's [22] idea of focusing on other disciplines from the perspective of physical education. Accordingly, the outcomes presented in Table 6 were included in 12 game-based physical activities.

The outcomes were integrated to the games from simple to complex. After this step, each plan was prepared separately for each experimental group. In other words, for a science lesson that would be delivered through a game, three lesson plans using different strategies in each experimental group were prepared. A total of 36 lesson plans were used in the procedure. The names of the games, their sources, science outcomes and implementation times are presented in Table 7.

Outcome 4, which is "Students discuss the dangers caused by moving objects in daily life", was included in all lesson plans. This is because of the possibility of students' encountering a dangerous situation due to the nature of the GPA course any time. As a matter of fact, there were some slightly dangerous situations in the implementation, and the teachers emphasized this outcome.

Instructional Procedure

The teacher in the control group (3-B) taught the class as what the science curriculum states. There was no researcher-made treatment in the control group. In this regard, the control group teacher started to present the topic with the course book. She then completed the instruction using the web-based education portal. During teaching, modules such as animations, puzzles, interactive activities, and experiment videos were used. Then, the students again did the interactive activities included in the education portal. Whereas the teacher mostly used the education portal for presenting the topic and evaluation questions, she assigned the students to answer the evaluation questions in the workbook at home.

Table 6. Student Outcomes of the science unit "Let's Learn about Force" and the GPA course

Outcomes of the science unit "Let's Learn About Force"	Outcomes of the GPA Course
1. Students observe moving entities and notice their motion characteristics.	1. Students make movements with increased agile.
2. Students discover that push and pull are forces.	2. Students make movements with increased accuracy by using awareness of body surface area, and movement relationships.
3. Students explain the concept of force by observing the effects of push and pull forces on objects at rest and moving.	3. Students make movements that require control over objects with increased accuracy by using awareness of surface area, effort and movement relationships.
4. Students discuss the dangers caused by moving objects in daily life.	4. Students develop movements that require control over objects. 5. Students explain the elements that pose a risk for themselves and their peers in games and physical activities with reasons.

Table 7. Names of games, sources, outcomes and implementation dates

Name of the game	Source	Science Outcomes	Implementation time
1.Stop	Traditional	1 and 4	Week 1
2.Run Fast	Curriculum	1 and 4	Week 1
3. Dodgeball	Traditional	1 and 4	Week 1
4.Lamb and Wolf	Researchers	1, 2 and 4	Week 2
5.Lamb and Sheep	Researchers	1, 2 and 4	Week 2
6.Rabbit Race	Researchers (Adaptation)	1, 2 and 4	Week 2
7.Tug of War	Traditional	1, 2, 3 and 4	Week 3
8.Seven Towers	Traditional	1, 2, 3 and 4	Week 3
9.Scored a Goal!	Researchers	1, 2, 3 and 4	Week 3
10.Flying Saucer	Researchers (Adaptation)	1, 2, 3 and 4	Week 4
11.Turkish Baseball	Researchers (Adaptation)	1, 2, 3 and 4	Week 4
12. Swinging Balloon 13. Flying Saucer 14. Turkish Baseball 15. Swinging Balloon	Researchers Researchers (Adaptation) Researchers (Adaptation) Researchers	1, 2, 3 and 4 1, 2, 3 and 4 1, 2, 3 and 4 1, 2, 3 and 4	Week 4 Week 5 Week 5 Week 5

The 12 activities designed for the experimental groups were implemented as one activity for each of the 12 lessons in the first four weeks. At the end of the four weeks, the students were asked to name three of the game-based physical activities that they liked most, and these three activities were implemented again in the fifth week.

In the experimental group (3-C) in which concepts were taught at the beginning of the activities, the teacher firstly presented the science concepts to directly the students gathered in the school garden. She then divided the students into groups depending on the type of the activity. She asked the students who could detect the concept presented at the beginning within the game to inform her during the game. These steps took nearly five minutes. The game then started with the teacher having a referee role. After the game that lasted about 25 minutes, the teacher asked the students to gather around in a circular shape. The teacher, who was in the middle of the circle, asked the students the questions included in the lesson plan and wanted them to answer these questions. For instance, the students were asked the question "What moves a frisbee?", and were expected to give the answer "force". The duration for this question-answer step was set as 10 minutes, and afterwards, the lesson was completed.

In the experimental group (3-A) in which the concepts were taught during the activities, the game started after the game rules were told. During the game, the teacher paused the activity by means of a referee's whistle at the point when a concept was experienced, and the students were asked questions related to this concept in the lesson plan. The teacher taught the concept based on the students' answers and the event that came up during the game, and the game continued where it was left. After 30 minutes, the teacher informed the students that the game ended by using the whistle, and asked them to gather around him. In the last 10 minutes of the course, the teacher summarized the science concepts included in the game, and gave the students the opportunity to ask questions and give similar examples, and the lesson ended.

In the experimental group (3-D) in which the science concepts were taught at the end of the activities, the teacher launched the game after informing the students about the rules. The game continued for nearly 25 minutes without any interruption. In the meantime, the teacher acted as the referee of the game. After the game, the teacher blew the whistle and asked the students to gather around her, and did direct teaching related to the science concepts for five minutes. Afterwards, she asked the students questions included in the lesson plan such as whether a science concept could be spotted in the game. The question-answer part lasted about 10 minutes, and the lesson ended.

Implementations in both the control and experimental groups were lasted in five weeks. The basic difference between the teaching of the control group and the experimental groups was the teaching environment. This is because the experimental groups attended the lessons in the school garden, whereas the lessons of the control group were in the classroom environment. Besides, in the experimental groups, game-based physical activities and materials related to these were used in every lesson. This was not the case in the control group where instructional materials were mainly based on the web-based education portal and the course book.

Data Analysis

In the achievement test and the EPA test, each correct answer was given one point. The maximum score was 15 points, and the minimum was zero points in these tests. After the pretest, posttest and retention test scores of the experimental groups and the control group were obtained the mean scores of the groups and other descriptive statistics were calculated. To examine whether the data showed a normal distribution, Shapiro-Wilks normality test, skewness and kurtosis coefficients, histogram, and box plot were used. As a result, the data belonging to two students that violated the normality were excluded from analysis. The number of students included in the analysis was 82.

One-way analysis of variance (ANOVA) was conducted to make between-groups comparisons based on the pretest, posttest and retention test results. The data showed that the assumptions of ANOVA were met. Post hoc tests were then used to identify between which groups there were statistically significant differences as a result of ANOVA. To reveal the effect size of the significant differences between the groups, Cohen's d value was calculated. The significance level was taken as .05 in the study. In the statistical analysis, SPSS 21 (Statistical Package for Social Sciences 21) was used.

Internal Validity

According to Fraenkel, Wallen & Hyun [23], “internal validity means that observed differences on the dependent variables are directly related to the independent variable and not due to some other unintended variable”. In this regard, the possible threats that can come out with respect to the design of the study, which are the characteristics of subjects, mortality, attitudes of subjects, testing effect, history effect, implementation effect, implementer effect and maturation, were at the lowest level in this study. This is because the students who participated in the study were selected from the same socioeconomic level and achievement level, there were no loss of subjects throughout the process, and the students were exposed to activities towards the same outcomes on the same day. Besides, each group was included in the process with its own elementary school teacher. Experimental group teachers had no professional experience on the method they used that could provide an advantage during the implementation. On the other hand, the use of instruments as pretest, posttest and retention test in the study can be seen as a threat. The reason is that the change in the students' scores in the second and even the third administration of the test can be due to their having taken the test before. However, the fact that the control group answered the same test in the same time span reduces this threat.

3. Results

Findings of the Achievement Test

The mean scores and standard deviations for the achievement pretest, posttest and retention tests are presented in Table 8.

Table 8. Descriptive statistics of the achievement pretest, posttest, and retention test scores

	Number of subjects	Pretest		Posttest		Retention Test	
Groups	n	$\overline{X}$	sd	$\overline{X}$	sd	$\overline{X}$	sd
Control	18	8,33	2,16	10,44	1,54	10,33	1,08
Experiment 1	22	8,05	2,95	11,14	1,81	12,63	1,78
Experiment 2	21	8,29	3,43	12,29	1,82	12,76	1,54
Experiment 3	21	7,38	2,78	12,14	2,03	12,28	1,73

*Maximum score is 15 points. $\overline{X}$: Arithmetical mean; sd: Standard deviation

Findings of the Achievement Pretest

One-way analysis of variance for independent samples was conducted to test whether there was a significant difference between the means of the groups. The results of this analysis are presented in Table 9

Table 9. ANOVA results of the achievement pretest

Source of Variance	Sum of Squares	sd	Mean of Squares	F	p
Between-groups	11,807	3	3,936	0,469	.705
Within-groups	654,193	78	8,387		
Total	666,000	81			

As can be seen in Table 9, there was no statistically significant difference between the groups based on the achievement pretest, $F(3,78)=0.469$, $p>.05$. Based on this result, it can be stated that all the groups that participated in the study were equal in terms of their prior knowledge related to the unit "Let's Learn about Force".

Findings of the Achievement Posttest

One-way analysis of variance for independent samples was conducted to test whether there was a significant difference between the means of the groups after instruction. The results of this analysis are presented in Table 10.

Table 10. ANOVA results of the achievement posttest

Source of Variance	Sum of Squares	sd	Mean of Squares	F	p	Partial η2	Force
Between-groups	44,498	3	14,833	4,486	.006	.147	.87
Within-groups	257,892	78	3,306				
Total	302,390	81					

The results of the analysis showed that there was a significant difference between science achievement of the groups, $F(3, 78)=4.486$, $p<.05$, $\eta^2=.147$. The partial eta-squared value indicated that the effect size was large (Green, Salkind & Akey, 2000). In addition, the statistical power value was .87, which is above the acceptable value (.80) in the literature. According to the results of the Bonferroni test conducted to determine between which groups the observed differences occurred (see Table 11), the science achievement of the experimental groups in which science concepts were taught during and at the end of the activities were significantly higher than that of the control group.

Table 11. Bonferroni test results of the achievement posttest

	(I)Group	(J) Group	Mean difference (I-J)	Standard error	p
Bonferroni	Control	Experiment 1	-,69192	,57790	1,000
		Experiment 2	-1,84127*	,58406	.014
		Experiment 3	-1,69841*	,58406	.028

* The mean is significant at the level of .05.

Cohen's d values were calculated to interpret the effect size of the means that were found to be significant. Accordingly, it was found as d=0.95 for the control and Experiment 2 groups, while it was d=0.87 for the control and Experiment 3 groups. Based on the criteria for interpreting the Cohen's effect size, the observed effect sizes were large in favour of the experimental groups.

Findings of the Achievement Retention Test

One-way analysis of variance for independent samples was conducted to test whether there was a significant difference between the means of the groups in the achievement retention test administered six months after the instruction. The results of this analysis are presented in Table 12.

Table 12. ANOVA results of the achievement retention test

Source of Variance	Sum of Squares	sd	Mean of Squares	F	p	Partial η^2	Force
Between-groups	72.375	3	24.125	9,641	.000	.270	.99
Within-groups	195.186	78	2.502				
Total	267.561	81					

As is seen in Table 12, there was a significant difference between the groups in terms of their retention levels six months after the unit "Let's Learn About Force" was covered, $F(3,78)=9.641$, $p<.05$, $\eta^2= .270$. Besides, the effect size was large, and the statistical power of the test was considerably high. According to the results of the Bonferroni test conducted to determine between which groups these differences occurred (see Table 13), the achievement retention scores of the experimental groups in which science concepts were taught at the beginning of, during and at the end of the activities were significantly higher than those of the control group.

Table 13. Bonferroni test results of the achievement retention test

	(I)Group	(J) Group	Mean difference (I-J)	Standard error	p
Bonferroni	Control	Experiment 1	-2,30303*	,50276	.000
		Experiment 2	-2,42857*	,50812	.000
		Experiment 3	-1,195238*	,50812	.001

* The mean is significant at the level of .05.

Cohen's d values were calculated to interpret how far the group means dispersed from each other, and it was found as d=1.27 for the control and Experiment 1 groups, d=1.33 for the control and Experiment 2 groups, and d=1.07 for the control and Experiment 3 groups. Based on the criteria for interpreting the Cohen's effect size, the effect sizes were large in favour of the experimental groups.

Findings of the EPA Test

The means and standard deviations for the EPA test administered at the end of the experimental procedure and six months after are presented in Table 14.

Table 14. Descriptive statistics of the EPA test

	Number of subjects	Post-Instruction Test		Retention Test	
Groups	n	$\overline{X}$	sd	$\overline{X}$	sd
Control	18	11.33	1.33	11.55	1.08
Experiment 1	22	10.95	1.62	12.59	1.78
Experiment 2	21	11.81	1.54	13.19	1.54
Experiment 3	21	11.86	1.31	12.07	1.73

Findings of the EPA post-instruction test

One-way analysis of variance for independent samples was conducted to test whether there was a significant difference between the groups. The results of this analysis are presented in Table 15

Table 15. ANOVA results of the EPA post-instruction test

Source of Variance	Sum of Squares	sd	Mean of Squares	F	p
Between-groups	11.724	3	3.908	1,828	.149
Within-groups	166.764	78	2.138		
Total	178.488	81			

As is seen in Table 15, there was no statistically significant difference between the experimental groups that received science instruction integrated with the GPA course, and the control group, F(3,78)=1.828, p>.05.

Findings of the EPA Retention Test

One-way analysis of variance for independent samples was conducted to test whether there was a significant difference between the groups. The results of this analysis are presented in Table 16.

Table 16. ANOVA results of the EPA Retention Test

Source of Variance	Sum of Squares	sd	Mean of Squares	F	p	Partial η^2	Force
Between-groups	26.375	3	8.812	4,093	.009	.136	.83
Within-groups	167.953	78	2.153				
Total	194.390	81					

As is seen in Table 16, there was a significant difference between the groups in terms of their retention levels, F (3,78)=4.093, p<.05, η^2= .136. The effect size was close to being large, and the statistical power was above 0,80. According to the results of the Bonferroni test conducted to determine between which groups this difference occurred (see Table 17), the retention scores of the experimental groups in which science concepts were taught during the activities were significantly higher than those of the control group.

Table 17. Bonferroni test results of the EPA retention test

	(I)Group	(J)Group	Mean difference (I-J)	Standard error	p
Bonferroni	Control	Experiment 1	-1.03535	,46637	.176
		Experiment 2	-1,63492*	,47134	.005
		Experiment 3	-,82540	,47134	.503

* The mean is significant at the level of .05.

Cohen's d value was calculated to interpret the effect size of the difference between the group means, and it was found as d=1.05 for the control and Experiment 2 groups. Based on the criteria for interpreting the Cohen's effect size, it can be stated that there was a large difference between the means in favour of the group Experiment 2.

4. Discussion, Results and Suggestions

This study investigated the effect of science teaching conducted with an interdisciplinary teaching approach through the GPA course on students' academic achievement in science and retention of science knowledge. The analyses showed that it positively affected the students' science achievement. This result is consistent with those reported in Hatch and Smith [8], Placek and Patton [9], Werner [10], Yi [11], Buchanan et al. [14], Hastie [15], Provost [16], and Seeds, Pollom and Burton [17]. While these studies presented science concepts to students through physical education skills, the current study presented these skills to students through gamification, which is a difference on behalf of this study. An example is the game "Turkish Baseball" that can develop students' skill of hitting the ball with a racket. Similarly, the game "Rabbit Race" is an activity towards developing students' skill of jumping. One way of implementing these practices effectively can be doing physical activities through gamification.

Another issue examined in the study was the timing of introduction of science concepts associated with the GPAs. The experimental group in which the science concepts were taught during the activities was more successful in science achievement than the other experimental groups. According to Piaget [25], third grade students (9 years old) participated in the study are in the stage of concrete operations in which the child is not capable of dealing yet with propositions or abstract conceptions. From this point of view, it can be argued that students in the experimental group two learned science concepts simultaneously when they appeared in the GPAs would be more successful than the other experimental groups in which students were introduced science concepts before or after the GPAs that might probably makes science concepts abstract for the students due to the time interval between presentation of concepts and their appearance in the GPAs.

In case the achievement test developed by the researchers

had a bias for the experimental groups, the EPA test was also administered in accordance with the instruction followed in the control group. The finding that the students in the experimental groups did not perform lower than those in the control group in the EPA test administered after the implementation can be interpreted as the success of the science instruction based on the GPA course. At the same time, the GPA-based science instruction also contributed to the students' retention levels as shown in the achievement and EPA retention tests.

In order to balance the duration of instruction in the control and the experimental groups, the experimental groups received the GPA-based instruction only in the science course. It can be argued that if teachers normally use other teaching approaches in science lessons, they can achieve more effective science instruction when they use the GPA course with the approach adopted in this study.

Based on the results of the study, it can be suggested for elementary school teachers who aim to teach science in an experiential, entertaining and active environment to use the GPA course in accordance with the interdisciplinary teaching approach. Guide booklets including lesson plans and information for teachers on how to use game materials, game rules, and games should be prepared in order to easily put GPA-based science instruction into practice. In this respect, there is a need to develop an inventory showing the overlap between the concepts in the games and science. Alternative materials should also be available in the case of a possible setback that can be encountered in GPA-based science instruction. For example, in this study, a Frisbee was stuck on a tree in the school garden during the game "Flying Saucer". At that moment, a spare Frisbee was used to be able to continue to the activity. Students can encounter minor accidents (e.g. crashing into each other, falling down while running) during the play in the school garden. In this regard, practitioners should be careful and take the necessary measures.

The model implemented in this study to integrate the unit "Let's Learn about Force" of the science course with the GPA course can also be used to integrate other units of the science course in further studies and its effectiveness can be tested. In addition, conducting studies towards the usability of the science and GPA courses with integration to other disciplines can provide opportunities to present both the science and the GPA course more effectively to students.

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The Effect of Situated Learning on Students' Vocational English Learning

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Abstract The current study aimed to find out the effect of situated learning on students' Vocational English learning. This research employed a mixed method research design. In the quantitative part of the study, pre-tests and post-tests were implemented to investigate the differences in students' vocational English learning between the experimental and the control group. Besides, the qualitative part of the research consisted of semi-structured interviews in order to explore students' perceptions about situated learning. This study involved 116 second grade students who were studying in the department of Accounting Information Systems. The data were gathered through an achievement test, developed by the researchers, and semi-structured interviews. A paired samples t-test and independent samples t-test were employed in order to analyze the quantitative data. Furthermore, descriptive analysis was carried out to analyze the qualitative data. According to the findings of the study, the average score of the achievement test for control group was found to be lower than the experimental group; however, a significant difference was not obtained. It was also unearthed that the perceptions of students about situated learning were mostly positive. Thus, it can be concluded that situated learning can be used successfully in teaching students vocational English.

Keywords Situated Learning, Vocational English, Accounting

1. Introduction

Formal education treats knowledge as a self-sufficient, and decontextualized of the situations in which it is learned and used. The main purpose of schools is to transfer the theoretical knowledge which includes mostly abstract and formal concepts [24]. However, in this information era, many researchers have discussed the separation of what is learned from how it is learned and used [1] because experts and practitioners in real life treat and use skills and knowledge very differently from formal education settings [16]. Hence, many students come across with problems in practicing the knowledge and skills learned through formal learning to their daily lives and work places [16]. Rather than the knowledge that is memorized, tested and then forgotten, the knowledge used by learners outside the schools is more valuable. The instruction which is given in meaningful, contextualized learning environments may be more understandable and applicable in authentic situations [22]. Hence, Situated Learning or Situated Cognition was expounded by [24] who claimed that knowledge was linked to the activity, context, and culture in which it was learned.

The critical characteristics of situated learning environments have been defined in previous studies [12, 18, 20, 26]. For example, Herrington & Oliver [18] defined nine characteristics of situated learning environments for the design of instruction as (1) authentic contexts, (2) authentic activities, (3) access to expert performances, (4) multiple roles and perspectives, (5) collaborations, (6) reflections, (7) diverse opportunities, (8) coaching and scaffoldings and (9) authentic assessment.

Firstly, in the instruction designed according to the principles of situated learning, authentic contexts reflecting the real world in which the knowledge is used, authentic activities which have real world relevance and require students' active participation should be provided. According to McLellan [14], "authentic contexts can be a/an 1) actual work setting 2) virtual representation of the actual work environment 3) anchoring contexts such as a video or multimedia program" (p. 8). However, there are conflicting opinions in the literature as to which contexts and activities are accepted as authentic. According to Hummel [13], "the implementation of situated learning theory by electronic media take an important step away from this theory since courseware becomes the learning environment and not the authentic situation" (p. 15). On the other hand, lots of researchers [24, 28, 30] asserted that computers can provide an alternative to the real-life setting and that such technology can be used without sacrificing the authentic context. Reeves [30] indicated interactive multimedia environments include opportunities for simulated apprenticeships and different

kinds of learning support activities. Collins (1988) stated that computers create situated learning environments that reflect reading, writing, mathematics, science and social studies in ways students learn in real life [cited in 20].

Also, in a situated learning environment students should be catered for access to expert performance and modeling or observation of real-life events as they occur together with multiple roles and perspectives that each student expresses different points of views. In situated learning environments, students have the opportunity to observe an activity or task before it is applied in real context, which is named as access to expert performances and the modeling of processes by Brown et al. [24]. For example, short movies of experts performing skills such as a teacher asking open or closed ended questions, or applying different classroom management strategies, a psychologist counselling a client, a building adviser assessing foundations, or a farmer judging the quality of a product allow students the opportunity to observe the experienced practitioners at work [24].

In addition, learners should be supplied with collaborative activities which support collaborative construction of knowledge and higher-order thinking skills as well as reflection processes that enable abstractions, and diverse opportunities to articulate, negotiate, and defend their knowledge [20]. Herrington et al. [21] stated that a successful teaching-learning process provides activities that direct students to define their own problems and solve them in collaborative interpersonal activities. Moreover, for successful learning, activities should be designed to require time over a period of days, weeks or months, rather than short time. In addition, authentic activities should be integrated into different subject areas and should allow for collaboration, reflection and multiple solutions [4]. Furthermore, instructors need to provide coaching and scaffolding in time to help students generate their knowledge in complex contexts, and integrate different tasks that make them effective performers and assess them in realistic environments and contexts.

While the theoretical literature about situated learning is abundant [18, 19, 20, 24, 27, 29], the situated learning method lacks substantive empirical support. Situated learning has been applied to language learning [2, 7, 31, 32], distance education library research course [1], educational technology course [25], the school principalship: seminars and simulations graduate course [11], and instructional strategies for students with special needs [5].

Various characteristics of situated learning environments were taken into account in various domains. In the study conducted by Huang et al. [21], a situated learning environment was created for an educational technology course. In this study, the authentic context was "parent-teacher" interview and students prepared all the materials needed for the parent-teacher conference as an authentic task, which required problem solving skills. Project artifacts were used as authentic assessments. The authentic context provided students with autonomy to make decisions about what software and skills to use. Comas-Quinn et al. [2] developed a webpage and blog for the situated learning environment. Students used a webpage and blog as an interactive repository to share examples of their cultural encounters with the location. Students took photos and prepared videos related to a foreign culture with their mobile devices and uploaded them to the cultural blog.

In the study of Pan [11], a situated learning environment was designed for school principals and they were provided with simulation materials and digital videos. The course consisted of class discussion seminars, simulation sessions in the computer lab, readings, and journal writing that enabled the students to reflect on their performance as school administrators. These computer-based instructional simulations substituted the experience of field practice.

The previous studies reported that situated learning helped to promote pre-service math teachers' higher-order thinking skills [19], indicated its potential to facilitate transfer to real world contexts [1], students had positive perceptions about situated learning environment [8], students demonstrated sophisticated problem-solving skills, exhibited metacognitive awareness, produced coherent artifacts, and high levels of motivation [6, 25] and promoted long-term retention, contextual and incidental learning of vocabulary [7], enhanced emotional and cognitive engagement [11].

Although various characteristics of situated learning environments in different subject areas were studied, there exists little research about language learning. Oura [10] emphasized the importance of attracting the attention of students by using different teaching methods so that they could learn English and use it in their daily lives, which is an important challenge that language teachers frequently face. For example, as stated by Uz-Bilgin [7], students complain about the fact that they forget the meaning of the words quickly and have difficulty in memorizing words which indicate that students generally do not know how to learn vocabulary and English in general. Hence, many teachers in different education levels adapt different activities involving authentic materials or media.

Nunan (1999) defines authentic materials for language learning as the materials that are not specifically written for purposes of language teaching but as spoken or written language data that have been produced in the course of communication [cited in 10]. For example, students practice listening and reading language drawn from various media, including movies, magazine stories, songs, talk shows, advertisements, radio broadcasts, e-mails, hotel brochures, and announcements [15], which offer students a valuable source of language input so that they are not being exposed to the language presented only by texts or teachers [10].

Although critical features of situated learning, which were indicated previously, were involved in different studies, there is little known about the effectiveness of situated learning on students' learning. While some studies indicated that situated learning increased student achievement [9], other studies did not indicate a significant difference [7].

Therefore, an investigation is needed to determine whether situated learning results in different effects with respect to students' knowledge acquisition. Moreover, studies investigating the impact of situated learning on students' vocational English learning are relatively few.

The aim of this study was to identify whether there was a significant difference between the achievement scores of students who were instructed according to traditional and situated learning principles. In this study, students who study in the department of Accounting Information Systems and take "Vocational English II" course do not have the opportunity to learn vocational English vocabulary in real-life communication. Hence, they use memorization strategies, which enable slow and less successful learning. In this respect, this study employed situated learning environments which provided authentic learning opportunities.

The Purpose and Significance of the Study

The current study aimed to find out the effect of situated learning on students' Vocational English learning. Furthermore, this study aimed to discover students' perceptions about the activities based on situated learning. In order to achieve the main purpose of the study, the following research questions were posed:

1. Is there a significant difference between pre-test and post-test English achievement scores of students who were exposed to traditional instruction?
2. Is there a significant difference between pre-test and post-test English achievement scores of students who were exposed to instruction based on situated learning principles?
3. Is there a significant difference between post-test scores of students who were exposed to traditional instruction and situated learning principles?
4. What are the perceptions of students about instruction based on the principles of situated learning?

This study is one of the experimental studies conducted in Turkey, examining the efficacy of situated learning environments on students' vocational English learning. Additionally, this study included situated learning approach by incorporating different characteristics of situated learning as authentic activities, expert modeling, instructor feedback, collaborative activities, peer feedback, in different contexts and with different materials. Finally, the present study, different from previous studies, included out-class authentic activities which were parallel to in-class activities.

2. Materials and Methods

2.1. Research Design

This research employed a mixed method research design combining both quantitative and qualitative method. Since the purpose of the quantitative part of the research was to investigate the differences in students' vocational English learning between the experimental and the control group, pre-tests and post-tests were implemented. Besides, the qualitative part of the research consisted of semi-structured interviews with students in the experimental group in order to explore students' perceptions about the effect of situated learning on learning vocational English.

2.2. Participants

This study involved a sample of 116 students who were studying in the second grade of Accounting Information Systems department in the School of Applied Sciences at a state university located in the West part of Turkey and enrolled in Vocational English II, a three-credit course. In accordance with the purpose and design of this study, experimental and control groups were formed. Two sections of this course were randomly assigned as the experimental and control group. In order to determine whether the two groups were equivalent in terms of academic achievement, the achievement test was implemented as pre-test at the beginning of the treatment. The pre-test mean score of students in the control group is $X=19.99$ and the mean score of students in the experimental group is $X=20.26$. In order to compare the groups, independent samples t-test was implemented and a significant difference between the groups was not obtained ($p>.05$). Hence, it can be said that both groups were equivalent at the beginning of the experiment.

2.3. Learning Environments

Students studying in Accounting Information Systems department take four Vocational English courses, in the second and third grade in both semesters. Students have been taught via traditional methods so far such as reading accounting-related texts and translating. Hence, students in the control group received instruction through traditional methods. They used a course book and read texts related to accounting and translated it into Turkish, then they answered reading comprehension questions and did fill in the blanks vocabulary exercises. However, students in the experimental group received instruction based upon the principles of situated learning. Students were presented with realistic situations that they might encounter in the real world. In the first week, students watched a video about balance sheets in class, through which the instructor presented the target vocabulary. Then, the students were asked to think about a problem that may occur in a balance sheet and then come up with solutions. Students discussed it in class in groups and then were asked to prepare a video discussing the problem and possible solutions outside the class. Students prepared videos and then shared them in their class whatsapp group until next week. Students gave feedback to other groups' videos and the instructor provided

instructional support when necessary. In the second week, the instructor showed a sample cash flow statement to the students and they analyzed parts of it in groups. Then, students were asked to act as an accountant and write a response e-mail to the manager in groups about complicated numbers on the income statement and the cash flow statement.

In the third week, the instructor showed a weekly sales report of a well-known shop located where they live and they talked about the rise and decrease in the sales report day by day, through which the instructor presented the target vocabulary. Students were then asked to receive the weekly sales report of different companies, talk to the manager about the report and record it as a video. Later, students shared videos and reports in class and talked about the increase or decline in sales, which an accountant does in real-life. In the fourth week, students were asked to bring different financial statements which they could find through internet or magazines. The instructor gave some financial formulas such as return on sales and return on equity. Then, students were asked to find out the ratios in the financial statements by using the formulas and then discuss the results in groups.

Thus, the curriculum represents a situated learning approach by incorporating authentic activities, expert modeling, scaffolding, instructor feedback, peer feedback and learning in different contexts and with different materials (videos, reports, internet sources).

2.4. Data Collection

This study lasted four weeks. The data were gathered in the spring semester of 2016-2017 academic years through an achievement test and semi-structured interviews. The target vocabulary for the achievement test was determined and the test was developed by the second researcher of this study who was teaching this course and another colleague who had taught this course before. Having prepared the draft test, expert opinion was taken from two English field experts. The final test included 32 multiple choice questions testing 50 target vocabulary from the four units studied during four weeks. Topics covered in four weeks include balance sheets, cash flow statements, describing change in sales report and gleaning information from financial statements. The target vocabulary were determined as "balance sheet, asset, liability, equity, own, owe, cash, inventory, accounts receivable, accounts payable, fixed assets, debt, sum, value, cash flow statement, inflow, outflow, cash distribution, dividends, stockholder, payment, generate, cumulative cash, proceeds, slightly, plummet, sharply, stabilize, steadily, recover, decline, rise, increase, go up, go down, fall, decrease, stable, unchanged, fluctuate, skyrocket, hover, assess, interpret, year-over-year growth rate, return on sales, return on equity, uncollectible, eat away at, keep record." The achievement test was administered both as pre-test and post-test.

Moreover, semi-structured interviews were administered to seven willing students in the experimental group at the end of the treatment to find out their perceptions about the activities and applications based upon situated learning. Four questions were prepared within the framework of situated learning activities. The draft interview form was presented to the views of two educational sciences expert for content validity. After feedback was received, the form was finalized by removing similar questions. Each interview lasted about 15-20 minutes and was conducted in Turkish to make students feel more comfortable in conveying their views and recorded for transcription. The interview questions are listed as:

1. How can you state the new method conducted in the last four weeks with one word or sentence?
2. What are your opinions about the first weeks of this course and activities and applications carried out in the last four weeks?
3. What do you think about the strengths and weaknesses of the activities and applications carried out in the last four weeks?
4. Do you prefer such activities and applications to be used in the next Vocational English courses? Why or why not?

2.5. Data Analysis

Statistical Package for the Social Sciences (SPSS) version 22 was used to analyze the quantitative data. In order to make comparisons between the groups non-parametric tests need to be used when the sample size is less than 30, and parametric tests are required to be used when the sample size is more than 30 [17, 23]. Therefore, a "Paired samples t-test" was used in order to compare the achievement pre-test and post-test mean scores within the experimental and control groups (sample>30) and an "Independent samples t-test" was used for the comparison of achievement pre-test and post-test results between the experimental and control groups (sample>30). Furthermore, descriptive analysis was carried out to find out the perceptions of students in the experimental group about the instruction based on the principles of situated learning. For descriptive analysis, the framework offered by Yıldırım & Şimşek [3] was followed. Hence, an analysis form consisting of the themes to be analyzed was prepared. Each theme was given a code and the data were analyzed in accordance with the thematic form and then findings were interpreted.

3. Results

In this section, data analysis of the results related to the four research questions is provided.

Table 1. Mean and standard deviation for the achievement scores of the control group

	M	*SD*	*N*
Pre-test	19.99	6.49	58
Post-test	28.29	14.04	58

As it was indicated in Table 1, post-test mean score (M = 28.29, SD =14.04) of students in the control group were higher than their pre-test mean score (M =19.99, SD =6.49). The mean differences between pre-test and post-test of the control group are shown in Table 2.

Table 2. Mean differences between pre-test – post-test of the control group

	M	SD	SE	t	Df
Pre-test Post-test	-8.30	14.25	1.87	-4.43	57

*p<.000

As it was unearthed in Table 2, students' post-test scores were significantly higher than their pre-test scores, t (58) = -4.43, p <.05. Overall results indicated that there was an improvement in the control group between the pre-test and post-test scores. The pre-test and post-test mean score and standard deviation of students in the experimental group were presented in Table 3.

Table 3. Mean and standard deviation for the achievement scores of the experimental group

	M	SD	N
Pre-test	20.26	8.76	58
Post-test	32.02	13.81	58

As it can be seen from Table 3, the post-test mean score (M = 32.02, SD =13.81) of students in the experimental group were higher than their pre-test mean score (M =20.26, SD =8.76). The mean differences between pre-test and post-test of the control group are shown in Table 4.

Table 4. Mean differences between pre-test – post-test of the experimental group

	M	*SD*	*t*	*df*
Pre-test Post-test	-11.76	16.66	-5.37	57

*p<.000

Data in Table 4 indicated that the post-test mean score of students in the experimental group was significantly higher than their pre-test mean score, t (58) = -5.37, p <.05. Overall results indicated that there was an improvement in the experimental group between pre-test and post-test scores.

In order to answer the third research question whose purpose is to investigate whether there was a significant difference between post-test scores of students who were in experimental and control groups, independent samples t-test was conducted and the results were indicated in Table 5.

Table 5. Post-test scores of the experimental and control group

	M	SD	t	df	P
Exp. Gr.	32.02	13.82	1.44	114	.15
Cont. Gr.	28.29	14.04			

*p>.05

As revealed in Table 5, the post-test mean score of experimental group was higher than that of the control group; however, this result showed no statistically significant difference (t = 1.44, p > .05). Hence, it can be stated that the vocational English achievement of students did not differ significantly.

Finally, in order to answer the fourth research question, the data obtained from the semi-structured interviews were analyzed and categorized into nine themes. The themes are 'authentic context', 'authentic activities', 'expert performance, coaching and scaffolding', 'multiple perspectives', 'collaboration', 'reflection', 'authentic assessment', 'positive sides of situated learning' and 'negative sides of situated learning'.

Authentic Context

The results indicated that students were satisfied with the learning environment generated through situated learning. Some of the sample responses were indicated below:

"Learning Environment facilitated learning, it was fun, it enhanced communication with the instructor." (S2)

"It was fun and enabled effective learning with materials" (S6)

Authentic Activities

Students stated that they were more active in situated learning contexts. Students were assigned authentic tasks which were similar to real world situations. Since they had opportunity to apply the topics learned in class to real life events often, they could retain more information about English. Some of the sample responses were indicated below:

"In the first weeks, the lessons were very monotonous, but after the new applications, I can say that the whole situation changed. Thanks to video works, we were more active in the lesson. In this way, we had the opportunity to revise what we have learned." (S2)

I was more active because in the previous lessons I did not revise the topics until the exams, hence I forgot. However, after preparing video based assignments, we learned more and the subjects became more permanent."(S3)

Expert Performance, Coaching and Scaffolding

According to the perceptions of students, the instructor helped students observe their performance and use the new knowledge as a model in their own tasks and activities.

"The instructor taught the pronunciation of words related to vocational English, corrected our mistakes and helped us choose the correct vocabulary and make accurate sentences, later we used this knowledge in our videos…" (S7)

Multiple Perspectives

Students believed that although assignments were very challenging, it facilitated learning more because of involving different tasks. Hence, students did not get bored and worked on different parts of the vocational English topics.

"The video tasks were very challenging, but it facilitated learning a lot because we used both visual and audial methods. For example, we watched videos, we prepared videos with our peers, we worked on a balance sheet and we wrote e-mail to accountants" (S4)

Collaboration

Cooperative participation was seen as one of the most important characteristics of situated learning by students because they shared their ideas and in this way they could learn from each other.

"The video assignments and tasks provided us to work in groups and collaborate." (S1)

"We spent more time as a group and came up with better products."(S6)

Reflection

According to the perceptions of students, they learned to analyze their own work and compare it with the work of their peers. One of the students stated that *"This method should be used in the next semester because thanks to this method I am aware of the fact that I can learn vocational English."*

Authentic Assessment

Students stated that instead of traditional evaluation methods, they liked authentic assessment because it focused on evaluating students' understanding and problem solving.

"The instructor gave feedback about our performance and corrected our pronunciation mistakes and helped us choose the correct vocabulary and make accurate sentences"(S1)

Positive Sides

It was stated by students that they were mostly satisfied with situated learning. Most of the students perceived that the activities and applications of situated learning were beneficial and that their communication and pronunciation improved, they learned better and their motivation increased.

"The course assignments and tasks were very hard and challenging… but thanks to the difficulty of the assignments, we tried harder and learned English better." (S3)

"I was less interested in lessons before this method, but later the course drew my attention and so my final grade was very high while my midterm grade was low." (S1).

"Different tasks provided us to pronounce better, learn the meanings of words easier and do the assignments more willingly." (S2)

Negative Sides

Although students were mostly positive about situated learning, some students indicated some weaknesses of it. Some students perceived the assignments given for each week as time consuming and very challenging.

"The course assignments and tasks were very time consuming. I felt overloaded" (S4)

"Video is a very challenging method." (S1).

"These assignments should not be given every week, they should be given occasionally because students may get bored due to the overload." (S6)

4. Conclusions and Discussion

The aim of this study was to find out the effect of situated learning on students' Vocational English learning and explore students' perceptions about the activities based on situated learning. According to the results of this study, students in both experimental and control group indicated an improvement between the pre-test and post-test scores; however, a significant difference was not obtained between the post-test scores of each group. This result is similar to Uz-Bilgin's [7] study, in which an improvement in students' vocabulary learning was found though there was no significant difference between students' post-test and retention test scores. In contrast, in the study conducted by Huang et al. [21], it was revealed that in the final examination students in the situated environment performed poorer than the students instructed according to traditional instruction in knowledge acquisition and use of more advanced technologies. The reason for this can be explained as groups in situated environment split up their work among group members after initial planning, and although students communicated among group members, they mostly tended to work on their share without paying equal attention to the skill areas others were working with. As also emphasized by Huang et al. [21], students mostly stayed in their comfort zone and did not try to learn other parts of the work that needs to be completed by another group member while preparing projects or in the final examinations.

Another result of the present study indicated that students were satisfied with the learning environment and perceived the learning environment as a factor that facilitated learning and enhanced their engagement and communication with the instructor. This result is consistent with the study conducted by Pan [11] who indicated that students' engagement was enhanced in situated language learning

environment. While students exhibited emotional engagement through expressing their thoughts and opinions about the drama in the discussions at e-meeting, they exhibited cognitive engagement by acquiring vocabulary knowledge and sentences with the help of scaffolding. Also, through asynchronous communication, students practiced engagement in writing essays about the drama.

In addition, it was revealed in the current study that although assignments were perceived very challenging, it facilitated learning more because of involving different tasks. Hence, students did not get bored and worked on different parts of the vocational English topics. In the present study, students practiced English by writing e-mails, preparing videos with their peers, working on a balance sheet and sales report. Providing students with the opportunity to practice the knowledge in different situations or contexts encouraged them to apply the knowledge to real-life situations as also stated by Catalano [1]. Although Huang et al. [25] indicated that transferring was not an easy process because of requiring higher cognitive skills, in this study students applied knowledge learned in class to out-class activities. Hence, by integrating in-class and out-class activities, misunderstandings were minimized. This result was consistent with the study of Yang [32] in which an online learning environment was created and students got engaged in both synchronous and asynchronous communication.

Examining the results of this study, it was unearthed that collaborative learning was one of the most important characteristics of situated learning because students shared their ideas and in this way they could learn from each other. The reason for this can be explained as group members' help which resulted in their learning much from each other and coming up with better products. Moreover, students mostly prefer learning from peers instead of instructor in both formal and informal learning contexts. Also, students learned to analyze their own work and to compare it with the work of their peers. Hence, they value learning from peers much. Supporting this result, in the study carried out by Utley [5], students at a teacher education course indicated cooperative learning theme as one of the criteria producing willingness on the part of class members to apply instructional strategies in their own practice.

Another result obtained from the present study was that students were mostly satisfied with the instruction based on situated learning principles. Most of the students perceived the applications of situated learning beneficial as well as fun. They indicated that their communication and pronunciation improved, they learned better and their motivation increased. Similar to this study, in the study conducted by Kim [15], it was disclosed that students found learning with videos enjoyable because several factors like students' motivation, interests and content of each week were considered while choosing video materials. Furthermore, in this study, it was ascertained that students were more engaged and active in the course because the instructor provided instant feedback and became a model in teaching vocational English.

According to the results of this study, it can be suggested that instructors should use a wide range of materials in class and suggest students to read books and magazines related to accounting, write e-mails, and watch advertisements and films in English to make connections between English learned in classes and the real world. In this study, students indicated the value of learning from peers as one of the important aspects of the course. Thus, cooperative learning based on the principles and practices of situated learning can be employed by instructors in class. In this respect, learners' processes in different learning environments such as mobile supported and virtual reality can be examined. Also, factors such as learner's motivation, anxiety, and learning styles can be explored by supporting with empirical findings in the future.

Finally, there were some limitations about the results of this study. One of the limitations of this study was its duration. Since it was hard to apply all of the characteristics of situated learning environment proposed by Herrington & Oliver [18] through a short term intervention, the duration of the study could be extended by embedding different contexts to help students learn vocational English. Hence, as a further study, it can be suggested that longer studies should be conducted in order to investigate the effect of situated learning on students' achievement. Also, a similar study can be conducted in general English courses. Another limitation of this study was its small sample size which restricts making generalizations about its findings. That is, the results cannot be generalized to all settings where vocational English is instructed. Thus, it is strongly suggested that a further research in different courses with larger sample size and in different grade levels should be implemented.

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A Place for Digital Storytelling in Teacher Pedagogy

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Abstract Traditional school subjects are challenged by the acceleration of access to knowledge in the new age of media available to both teachers and students. Teachers who are socialized into existing traditional practices are now encouraged to introduce technology into their pedagogy. This Paper explores a particular way in which teachers can creatively introduce a new and useful technology known as Instructional Digital Storytelling (IDS), guided by the Technological, Pedagogical and Content framework (TPACK) developed by Mishra and Koehler [1]. It illustrates how, through narrative inquiry, teacher experience of both the creation and use of Digital Storytelling for instructional purpose in a Secondary School setting, highlighted challenges, rewards, accelerated learning and developed a community of practice across subject disciplines. The focus is on the reconstruction of the experience of creating a Digital Story on four levels: a) Internal structures of blending voice over, imagery and sound to create a successful IDS; b) Experience of challenges and negotiations in crafting the story; c) Experience of sharing with students; d) Recognition of themes and patterns which may have emerged among the participants.

Keywords Digital Storytelling, Community of Practice, Technology Pedagogy Content Knowledge (TPACK) Instruction, Reflection

1. Introduction

This Paper is based on research carried out with four Irish Post-Primary school teachers who were invited to integrate a new technology known as Instructional Digital Storytelling (IDS) into their pedagogy. Maeve was a teacher of Business Studies, Louk Mathematics; Fintan English and Iosef Design Communication Technology (DCG). The invitation resulted from personal experience of what I found to be successful in the process of teaching and learning. I wished to share my experience to see if it might be as effective for others. As a practitioner, based in the same school as the four participating teachers, I was also developing a form of continual professional development by initiating and engaging other teachers in a structured inquiry which involved learning about, developing and implementing technology in a meaningful way in their classrooms. It involved integrating technology with a story which could either be used to introduce or explain a concept, solve a problem, illustrate an example or inspire students.

The Teaching Council of Ireland had recently consulted with teachers to learn about their experiences of professional learning. The result was a Draft Consultation Paper Cosán [2] which proposed autonomy for teachers to engage in professional development. This inquiry was an exploration of the challenges of such an endeavor at a local, school level. It explored the challenges, rewards and limitations which four teachers faced while engaging with Instructional Digital Storytelling and whether they perceived the process of this experience as positive and effective. It sought to understand whether the creation of Digital Stories stimulated the development of their technological, pedagogical and content knowledge (TPACK), a framework which Mishra [3] argues is a requirement for successful teaching in the twenty-first century.

The methodology was positioned within narrative inquiry, which concentrated on the voice of teacher experience. It involved listening to the teachers' individual stories of their experience, and a meta-narrative of their pedagogical stories was developed. The design comprises two forms of story as data. The first form is an Instructional Digital Story (IDS) developed by each teacher for use in a curriculum lesson within their subject area. The second form is a Reflective Digital Story (RDS) about each teacher's experience of creating and using the IDS. The second form of Digital Story (RDS) adopts a broader approach to a narrative inquiry where participants usually voice personal stories of experience during interviews and discussions.

2. Rationale

The Organization for Economic Co-operation and Development [4] carried out a survey of Teaching and Learning at International level (TALIS), which focused on certain aspects of professional development for each of the

twenty-four participating countries, of which Ireland was one. One of the four areas identified for development in Ireland was technology. The purpose of TALIS was to '*assist countries to review and develop policies to make the teaching profession more attractive and more effective*' (p. 3). In response to TALIS, the Teaching Council of Ireland [5] developed a policy on the Continuum of Teacher Education to include the areas identified for Ireland. The policy stated that following initial teacher education and induction, provision and resources should be provided to enable teachers to develop and build on '*innovation, integration and improvement*' (p.10). Alongside continual professional development (CPD) provision by the Department of Education and Skills (DES), teachers in Ireland are currently encouraged to take responsibility for and shape their professional learning, to evaluate their pedagogical beliefs and practices and to engage in collaboration. Teachers are also encouraged to share their expertise and experience with other teachers as part of a cascading process.

Within Irish secondary schools, professional development, under the leadership of a Joint Managerial Body (JMB) takes place as part of the teaching contract and is led by school management. Traditionally, this takes the form of outside facilitator presentations and staff collaboration within subject departments during a time set aside for planning. Subject in-service is also organized by the Professional Development for Teachers (PDST) within Education Centres over the course of the academic year. In total, teachers are required to engage in a minimum compulsory thirty-two hours of professional development each academic year.

Within this context, there were two strands which combined to determine interest in developing this inquiry into teachers' experiences of creating and using IDS. One of these, as already stated, related to the curiosity that was stimulated as a result of my developing relationship with Digital Story. The other grew out of readings around research and educational policy in Ireland that focused on what either helped or hindered student's learning and the potential role that technology could play in enhancing meaningful learning.

Creating a Digital Story is a relatively simple process, but the creation of an interesting one is artful. Furthermore, the creation of one for instruction in the form of IDS is a challenging experience. This led me to focus on challenges teachers of different subjects may experience while creating an IDS and the values and attitudes they attach to that experience. The conceptual framework chosen for IDS is technology, pedagogy and content knowledge (TPACK). Knowledge in all three domains is necessary for the creation of IDS. The definition used for IDS stems from the design promoted by the Centre for Digital Storytelling (CDS) in Berkley, California [6]. Relating Storytelling to TPACK: '*The modern expression of the ancient art of storytelling: It uses digital media to create media rich stories to tell, to share, and to preserve*'.

The basis of teachers integrating technology with their storytelling pedagogy lays within the work of Shulman [7] and more recently the work of Mishra and Koehler [8]. Shulman [7] originally developed a framework which blended teacher content knowledge with pedagogical knowledge, meaning the teacher transforms subject content in a way which can be understood by learners. This framework later became known as Pedagogy Content Knowledge (PCK) and, in more recent years, was developed by Mishra and Koehler [8] to incorporate what teachers must know about technology. Thus, it was renamed as Technology Pedagogy and Content Knowledge (TPACK). Mishra and Koehler [8] state: '*The basis of our framework is the understanding that teaching is a highly complex activity that draws on many kinds of knowledge. Teaching is a complex cognitive skill occurring in an ill- structured, dynamic environment..... There are clearly many knowledge systems that are fundamental to teaching, including knowledge of student thinking and learning and knowledge of subject matter*'. (p. 1020).

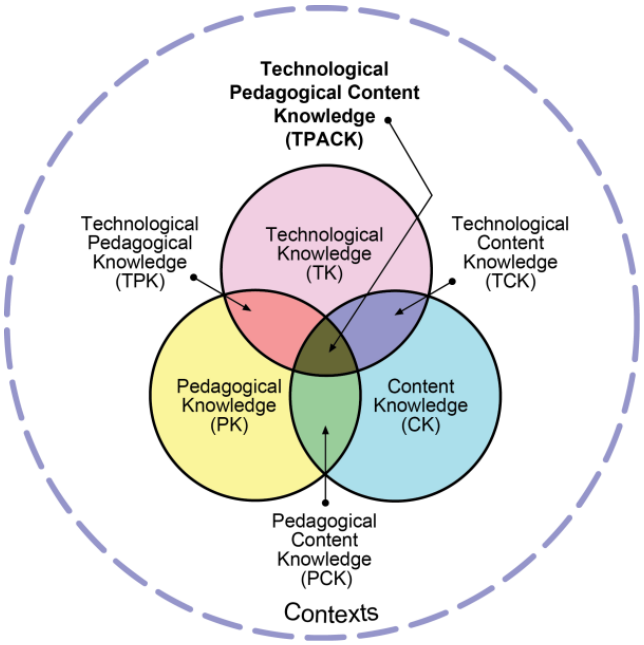

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Figure 1. Venn diagram representing intersections of TPACK

Mishra and Koehler [8] argue that teaching should involve all three types of knowledge: technology knowledge (TK) involving skills which relate to standard and more advanced technologies; knowledge of pedagogy (PK) including the methods of teaching and content knowledge (CK) relating to the content to be taught. For explication here, TPACK is set out as a dynamic framework, which can be used to interpret a teacher's experience of gaining knowledge within the domains of technology, pedagogy and content, required for creating and using IDS and RDS.

The role of creating Digital Stories for both instruction and reflection in education is, according to McGee [9], a well-known strategy, especially in pre-service teacher education programmes Ohler [10]; Robin, [11]; Thompson-Long [12]. Stories are explored through the

concept of story circle in the world of Digital Storytelling, where they are shared before creating them Lambert [13]; McGee [9]; Meadows [14]; Ohler [10]. Such circles serve to develop a sense of bonding among sharing communities according to Lambert [13], who along with Dana Aitchley (at the Centre for Digital Storytelling, California) was the originator of the concept of story circle as an integral component of Digital Storytelling. When teachers collaborate and share stories, they are usually sharing what works or does not work for them in the classroom. It is this type of collaboration which the Teaching Council of Ireland [5] encourages in CPD.

Technology was highlighted in a report by the OECD and UNESCO [15] as an important feature in teacher professional development. It stressed the importance of the teacher having an understanding of its pedagogical use and being trained to integrate it into classroom practice. Llorens *et al* [16] agreed with this when they drew attention to a digital divide among teachers who had not received adequate support in how to use technology skills. Adopting a similar viewpoint, Lawless and Pellegrino [17] highlighted concerns about the quality and efficacy of teacher training programmes in the USA, suggesting poor training may also create a digital divide between students and teachers. They drew attention to studies which acknowledged high-quality professional development, over a long period, within a meaningful context and which encouraged collaborative learning communities. These studies highlighted the connection of high quality CPD to student achievement Alderman *et al* [18]; Desimone *et al* [19]; Sparks [20]. In contrast, several years later in the Irish context, Clarke [21] identified proficiency in usage and technical issues in a project within initial teacher education in the Northern Ireland context. She reported on a pilot project which built on educational technology research in Ulster. Students on an initial teacher education programme were provided with iPads which had basic creative applications, and they were encouraged to use them while on teaching practice. The data collected gave evidence of pedagogical issues which involved confidence in using the iPad.

The integration of technology is described by Mishra and Koehler [1] as a complex issue for many teachers and suggesting that rather than concentrating on the technology itself, professional development programmes should follow the lines of curriculum content and pedagogical approaches to integrating new technologies. This means redesigning programme experiences in order to develop the knowledge teachers need to integrate a particular technology. In addition to this Mishra and Koehler [1] have suggested the context or environment in which teachers work should be taken into account.

3. Methodology

Practitioner-based research does not describe the research method employed, but it does define my identity and relationship with the teachers. It had a direct influence on the choice of narrative inquiry and particularly digital narrative. The justification for the inquiry being practitioner-based is because I am a practitioner in education and was eager to gain knowledge about how others experienced what I found to be successful in my own pedagogy. It is also important to highlight that I viewed it as a path which would provide space for experienced teachers to collaborate. The consequence of this type of collaboration was intended to empower teachers to voice their experience as well as enhancing my own knowledge and making a contribution in the field of research.

3.1. Why Narrative?

Narrative inquiry is defended by Clandinin [22], who maintains it is growing in acceptance in the field of social research. It is the study of experience by listening to participant voices. It involves "*collaboration between researcher and participants, over time, in a place or series of places, and in social interaction with milieus*." Clandinin and Connolly [23] p.20. Several inter-related reasons for using narrative are also described by Cortazzi [24] as: '*concern with the meaning of experience, voice, human qualities on the personal and professional dimensions, and research as a story*' (p. 385). I considered all of these reasons, viewing them as reliable introductions to personal and professional lives as well as identities Clandinin & Connolly [23]; Connelly & Clandinin [25]; Doecke *et al*. [26]; Goodson [27]; Jalonga *et al*. [28]. Also guiding my choice of narrative was the work of Raymond *et al*. [29] and Elbaz-Luwisch [30]who, along with Cortazzi [24], promote narrative as representing the meaning of experience and encouraging participant voice. I was conscious of ongoing narratives all the time, although there were times when narrative was deliberately engaged as part of the research process.

The aim was to highlight not only moments of experience when digitizing instructional stories but also the complex landscape for the school curriculum within which they were created and used. Influenced by the words of Etherington [31] who, while discussing the variety of meanings attached to narrative research stated '*what does seem important is that I describe what it means to me (at this point) and the assumptions and ideas upon which my practices are based*' (p.71). When teachers talked about their pedagogy of teaching and the type of technology they used, they were discussing what already works or does not work in their lessons.

3.2. Narrative as Story

The use of narrative to gain knowledge of participant experience engaged the art of story, a view shared by narrative researchers who believe we live storied lives in a storied world Etherington [31]; Gergen and Gergen,[32]; Sarbin, [33]. Narrative is not simply a mirror or reflection of

reality, as it often shapes it Connelly& Clandinin [34]; Smith & Sparkes [35]. Mishler, in conversation with Clandinin and Murphy [36] differentiated between narrative analysis and analysis of narrative, describing the former as a general form of qualitative research where the researcher organizes data into themes and categories. While narrative analysis '*understands lives as unfolding temporarily, as particular events within a particular individual's life. The final result is a story*'(p.642). I was conscious of the shift Johnson [37] describes as developing from the single mode of voice to multimedia forms. I also heeded a warning by Gomez *et al*. [38] about the importance of sensitivity when investigating personal stories. This strengthened my decision to use RDS as a method to gain a deeper sense of teacher experience.

3.3. Reflective Digital Stories

Lambert [39] describes Digital Story as a form of reflective practice, suggesting work which requires creativity uses a component of effort, requiring deeper reflection. For the creators of the RDS, it offered the chance to relive and re-evaluate experience. It provided a potential opportunity to write about experiences which maintained temporality, sociality and place as described by Clandinin and Connelly [23]. By seeking experience through digital narratives, which required participants to speak their own words, edit them and combine this with image and sound, it carried a powerful meaning as a reflective practice. Conscious that one of the challenges often facing narrative inquiry is how the participant is represented in the data; the creation of RDS' gives real-time to the voices of the teachers and enables them to represent their data. In addition to this Lambert [13] suggests the use of self-narrative in the creation of a digital story can lead to a new realization and further insights. Lambert [39] describes reflecting in digital story form as a means of encouraging the creator to consider issues that are important to them, as well as an awareness of why. The RDS was created after a second workshop and was a key factor to the participants' evolving sense of using Digital Story (DS). By editing voice with a mix of images and sound which carried '*their own powerful meaning*' p.27 Lambert [39] they had an opportunity to potentially develop what Denzin [40] refers to as a re-lived epiphany.

3.4. Selection of participants.

Teachers of English, Mathematics, Business Studies and Design Communication Technology (DCG) within the school where I taught were invited to participate in the research. These subjects were chosen on the basis of English and Mathematics being core subjects and Business Studies and DCG being popular foundation subjects. Core subjects are compulsory for all students while foundation subjects are chosen because students have a particular interest in studying a particular subject. All four subjects have a history of traditional instruction.

Conscious of the fact that these teachers were and would continue to be my colleagues and they might feel obliged to say 'yes', a detailed explanation stating they were under no obligation to join the research group was provided in a letter. Consent forms further outlined the commitment. The four teachers were selected from a short list based on the criteria of teaching Junior Cycle, use of story for instruction and integration of technology into pedagogy.

Workshops were provided outside of school hours, off school premises, which instructed the teachers on how to create and use DS, which enabled them to become familiar with the phenomenon of it and gave an opportunity to have future meaningful discussions. The place organized for the workshops and discussions was at a local hotel. It was important to separate personal school agendas, held by each teacher, from the focus of the research. The place where the teachers chose to create the digital stories for instruction and reflection was within the privacy of their homes, away from the disturbance of school bells and other disruptions.

3.5. IDS Workshop Aims and Objectives

The aims of the workshop were to: Categories stories as: Case study; narrative; problem solving; scenario Andrews [41]; train the teachers in the process of DS; review their familiarity with the hardware and software and provide any support or information necessary.

The objectives were to facilitate each of the teachers to: choose a category of instructional story suitable to subject and age of students in their chosen Junior Cycle class; define purpose of the IDS with specific topics and learning goals through the process of story circle; develop technology knowledge in the use of software; practice and develop appropriate voice pitch and pace; integrate as necessary the power of metaphor into the story; choose appropriate symbolic or visual images and choose music/sound which can be used in an emotive and evocative way.

The teachers were able to access visual material, links and notes for digital story telling through a shared folder using 'Dropbox'. This downloadable free cloud storage service allowed participants to share files.

During the workshop a distinction between storytelling and Digital Storytelling was based on Porter's [42] experience of Lambert's Storytelling workshop. She promotes storytelling as an art form using the Story ARC involving six elements which turn tales into stories. She contends the main character of any media production needs to be the ARC. The aim of the digital medium is to create sensory feelings for the unfolding of the innate qualities of the story. This indicates that lessons learned and 'living in ' the story need to be developed before the Story ARC can unfold. The first element is living in the story, where the author, who does not have to be the main character, carefully chooses words and pitch of voice in order to create an emotional connection.

Porter maintains the voice-over creates an opportunity for

an emotional journey for both the author and viewer to 'live' the story. The second element, lessons learned and understanding gained, lies within the ARC which has a particular point to it. The understanding taken from the knowledge of the story develops a spine. The spine helps deal with the third and fourth elements of tension which creates a hook for the listener and economy of the story, such as what is left in and what is left out during the editing process. This is the process which ultimately impacts on the viewers in the final version of the story. The fifth element is the visual detail interwoven with the spoken word so the obvious does not have to be stated. The sixth element is craftsmanship where the creator uses technology in a creative way. These elements rely heavily on the importance of the creator using well researched content (CK) and developing it in a creative way as an instructional story (PCK) appropriate to the subject before enhancing it with technology (TPACK). While it is useful to look at all three areas separately, it is necessary for all three to converge for the master teacher using Digital Story.

3.6. Workshop for Reflective Digital Story

The process of story circle served to encourage the teachers to share reflections on their experience of creating and using IDS. The aim of the workshop was to encourage the teachers to engage in reflection on their experience of creating the IDS. The objectives were to encourage each of the four teachers to use the process of story circle to share challenges, rewards and negotiations made while creating and using the IDS; examine these challenges, rewards and negotiations in detail and make sense of personal experience through story.

3.7. Method of Analysis

From the very start of the inquiry I developed a habit of writing and drawing memos of things I noticed during story circle, workshops, comments made by the teachers, responses when organizing meetings and periods of silence. Some of the memos served to triangulate data, which was gathered through recorded interviews, discussion, story circle and the RDS. All of these served to clarify subsequent coding of themes and analysis of data.

Charmaz [43] describes memos as serving a variety of purposes in an inquiry, but stresses their role in creating theoretical categories. As I wrote the memos, particularly during the story circle process prior to creating the IDS and RDS, I developed themes based on my interpretation of what I perceived to be the experience of each participant. I added these to the ones initially derived from the research questions and literature review, based around the seven elements of technological, pedagogical and content knowledge which Mishra [3] perceives as knowledge a teacher requires to teach successfully. I developed colour codes for each of the themes emerging from research questions during interviews (Table 1) Using these colour codes I further analyzed the narrative data produced from transcribed voice recordings of interviews and story circle and developed sub-themes using a pen and paper system (Table.2). This involved reading the transcript at least four times, once for the whole story, then listening to the first person voice and the relational voice of their experience and finally to develop my interpretation of the meaning behind the voice. These themes served to provide information for the data analysis and discussion. Each of the following grids shows the process of analysis.

Table 1. Themes from data collected during interviews, story circle and RDS

Beliefs	Challenges	Negotiations	Emotions	Aim of IDS
Use of story; Classroom management; Personal stories	Topic; Time; Deciding images; creating story	Mixed ability classes; curriculum; learning styles	Nervous, pride	Deep understanding

Table 2. Sub-themes developed from the main themes

Values	Attitudes	CPD	collaboration
Technology; story; developing pedagogy; student ability; student learning; CPD; time	Whatever works for me; learning is better when linked to real life; deep understanding; visuals; personal approach; deep understanding	Lots of attendance at in-service; experimenting	Contract hours for CPD; subject departments and associations; first time collaborating across subjects

Coding was based on frequency of observed behaviour noted in my research memos and comments made by the participants during interviews, story circle and RDS. The memos were used in support of comments, such as how the comments were made, for example nodding and shaking of heads, facial expressions and laughter.

The sub- themes which were generated are illustrated in (Table.2). These were taken from references participants made to a specific matter throughout individual interviews. These were then used to analyze the data in relation to each research question as outlined in the main findings.

4. Main Findings

In answer to the following question: *How does the experience of creating a Digital Story for instruction facilitate the development of Technology, Pedagogy and Content Knowledge?* The main findings determined a pedagogical shift took place for each teacher. Identified challenges included choice of content suitable for IDS; pressure to deliver curriculum; suitable images for IDS; recording of voice over; developing a story. The aim of lesson content to be taught influenced the style of IDS. Acceleration of student learning was established. All four teachers described the creation of a Digital Story as time consuming. Two of the teachers did not develop their pedagogy through the use of story.

In answer to the question: '*How does the experience of creating a Digital Story for reflection facilitate the development of Technology, Pedagogy and Content Knowledge?* The following findings determined that teachers developed all areas of TPACK in their reflective DS. They learned to enhance RDS by using metaphorical images. RDS deepened teacher reflection and future plans for using IDS were clearly stated. Reflection expressed beliefs and values as an influence on the chosen style of IDS. Two teachers beliefs expressed curriculum guidelines as a limitation to the creation of future IDS. Teachers reflected on everyday creativity used to create IDS.

The main findings resulting from the question: *How do teacher values and attitudes throughout the process of creating Digital Story influence their beliefs in practice?* All four teachers valued pedagogy which they already deemed to work in teaching and learning. However, they were willing to learn new technology. Time constraints of the curriculum influenced the integration of technology. Several of the teachers valued readily available technology found on the internet.

The main findings determined from the question: *How did professional development impact on the development of TPACK for teachers situated within a school environment?* Each teacher openly shared knowledge and ideas within story circle. Limitations and challenges of subject disciplines when creating IDS were highlighted and discussed as a result of a collaborative setting. Learning from the experience of others assisted the application of new knowledge when creating RDS. All four teachers reported self-efficacy after using personally created IDS. Two teachers discussed the possibility of creating future libraries of IDS if time could be found during planning.

5. Discussion

At the start of the inquiry all four teachers illustrated their perceptions of storytelling and described how they told stories in either first or third person. They explained how they believed this enhanced student understanding of content and concepts they were teaching. However, when asked to plan and create a Digital Story around the aim of a lesson using their CK, two of the teachers were challenged by the common denominator of story and deviated from the art of storytelling which they had earlier described as a method they used to engage student audiences on many levels. They had concurred that it acts as the hook and '*is the best way to convey information*' (p.177) Schank *et al* [44].

Instructional story lies within the pedagogical design of the lesson and it is within the storyboard process where the intersections of TPACK are applied. The content knowledge (CK) is storied; the art of creating the story requires pedagogy knowledge (PK); the storied content therefore requires an understanding of the intersection of PCK; the addition of images and sound necessitates technology knowledge (TK); the knitting together of technology and content develop TCK and the images and sound enhance the pedagogical art of storying TPK. The successful blending of all elements develops TPACK. The teachers who developed IDS using story created a socially mediated lesson. These findings suggest more time and effort should be invested in story circle based on the lesson content, which may challenge the teacher to develop a story core in order to create Digital Stories.

Each teacher demonstrated different confidence levels in the use of story within IDS. Iosef had the opportunity to cut across trans-disciplinary boundaries of technical and mathematical elements by adding a problem to be solved, or a scenario where characters attempted to solve a problem. Had he asked himself questions like '*What will the twelve and thirteen year old students see and hear when they view the IDS? How will they see its relevance to the real world*?' he may have been influenced to write a story. Instead, he described how he aimed to teach the basics to junior classes '*because my subject is technical and it's something I wanted to get done in class.*' He also described how he felt under pressure to deliver the curriculum which concurs with findings of Ertmer *et al.* [45] highlighting teacher use of technology as connected to curriculum requirements. He originally described himself as a storytelling teacher and later altered his description, referring story use to teaching senior students only.

When planning his IDS Fintan also did not ask himself

questions such as '*How will the boys and girls in my class relate to this? How relevant will it be to their experience of travel*?' Instead he described how his focus was on the aim of the lesson and only considered the students later when he narrated the words he was encouraging them to use in descriptive writing. It can be argued that Fintan's story is border line to the official definition of Digital Story. He took his audience on an imaginary journey. Although he did not use characters, he did place his students into the story by asking them to imagine themselves walking through the various landscapes of his chosen images (TK) using their listening, feeling and visual senses. This was Fintan's way of overcoming his hesitation to write a script which he would otherwise have told spontaneously. He developed TCK by adding images to his chosen descriptive narration; TPK by creating a video but did not develop CPK because the pedagogical approach for a Digital story is the use of story. He believes his spontaneous storytelling pedagogy has a genuine emotional attachment to his lesson and by digitizing such a story '*I would be contriving*'. His video did however, relate to real life situations of walking through different landscapes, and the students were fully engaged. The lesson aim of engaging students in discussion and a writing exercise was also achieved.

Both Maeve and Louk thought deeply about delivering their content differently. They both asked themselves '*How can I deliver this story while also achieving the aim of the lesson*?' In her reflection Maeve indicated development of PCK when she described her intention to create a story which would stay with her students for a long time. She illustrated TCK when developing her story process using images of characters and TPK when she described her plans to use the images for future IDS. She holds strong beliefs about the power of story in teaching and learning and described how she found the task exciting in that she was planning to deliver the content of book keeping and petty cash in a different way. Her beliefs in the value of storytelling to promote instruction enabled Digital Storytelling to facilitate her development of TPACK.

Louk developed a story which his students could relate to while also learning the topic, suggesting development of PCK. He holds strong beliefs about relating his lesson content to real life situations, and his beliefs drove his story arc. He demonstrated TPK when he connected with the interests and level of his students by using TCK in selecting images of his daughter as the emotive element rather than using himself as the character. He presented his daughter as a fictional character, assuming the attention of the young second-year students' in his class would be captured by this clearly indicated development of TPACK.

All four teachers had existing pedagogical content knowledge PCK, and they indicated a variety of experiences in using technology for instruction. The workshops provided the specific knowledge required to develop a story around content and how to integrate technology with story. In other words, all four teachers received support in developing TPK. However, the different subject domains left the teachers without support when developing TPACK. Two teachers (Fintan and Iosef) indicated technology content knowledge TCK development from the experience of creating a video as an IDS, but their beliefs surrounding the use of story hindered the development of the intersection of technology pedagogy TPK facilitated by IDS. Their output indicates they did develop the intersection of pedagogy and content knowledge PCK in that they presented content to their students in a personally creative and engaging way by integrating technology. They reported a high level of self-efficacy after creating and sharing their product. They developed TPACK, but it was not facilitated by Digital Story. Two teachers (Maeve and Louk) embraced the value of story and were creative in presenting their stories, developing all elements of TPACK. They used their content knowledge to create a story, their pedagogical knowledge to create an engaging story for the students in their class and their technology knowledge to enhance the story. They successfully knitted together all three knowledge domains during the process of storyboard and created IDS. This highlights two important factors of belief and creativity.

My analysis of the process and outputs sought to find commonalities of thinking and strategies between teachers from different disciplines when describing their experiences of creating an IDS. I expected the teachers to independently craft a story based either on or around the content or concept as part of their instruction. This did not happen in all cases and points in the direction of a need for further workshops and discussion of using story for instruction.

5.1. RDS and the Development of Technology Pedagogy and Content Knowledge?

The collaborative process of the reflective story circle served to identify three factors highlighted by Rodgers [46]:

1. Affirmation of the value of one's own experience. In isolation, what matters can too easily be dismissed as unimportant;
2. Seeing things "newly" –others offer alternative meanings, broadening the field of understanding;
3. Support to engage in the process of inquiry.....(p. 357)

Reflections by the teachers were both personal and emotionally charged. Albeit limited within the confines of the task they rendered their stories of personal experience, carefully selecting technology features of imagery and sound which enhanced the deeper meaning of their reflection within a time parameter. The process of editing the story, necessitated by each slide, assisted each teacher in clarifying the meaning of their experience.

In contrast to his IDS, in his RDS Iosef chose metaphorical images which reflected his challenges in searching for perfection. All the images were his personal photographs, highlighting not only the TPK element but also his deep content knowledge of the woodworking component of his

teaching subject. Louk also used personally owned images and he chose to present them in black and white because he said he wanted the RDS to have a unified aesthetic appearance and believed images with various colours would impact negatively on it. Both Maeve and Fintan illustrated TPK in their selection of images from the licensed site. Fintan chose not to use his own photographic images because of the time element it would add to the creation of the RDS. Maeve had difficulty choosing images because she spent so much time searching for the most suitable. She described how she could have continued searching but decided to conclude due to time pressure. She was still unsure about her choice of images when viewing the finished product and as a result of this, she plans to build a library of images for future IDS illustrating her intention to further develop TPK.

The creation of an RDS facilitated the development of TPACK for all teachers and enabled them to develop a deeper insight into their practice by analysing the personal use of storytelling as part of instruction and evaluating newly learned technology integration. This type of reflective practice is in line with standards of good practice proposed by the Teaching Council of Ireland [47].

In contrast to the creation of the IDS', the teachers created their stories in a short space of time. They did not have to analyse suitable topics or negotiate student audiences. They storied real experiences which they believe had an impact on their teaching intentions. They had developed a tacit knowledge during the creation of the IDS, and the planning and creation of the RDS enabled an awareness of this which provided a rich implicit knowledge thus providing stories of experience.

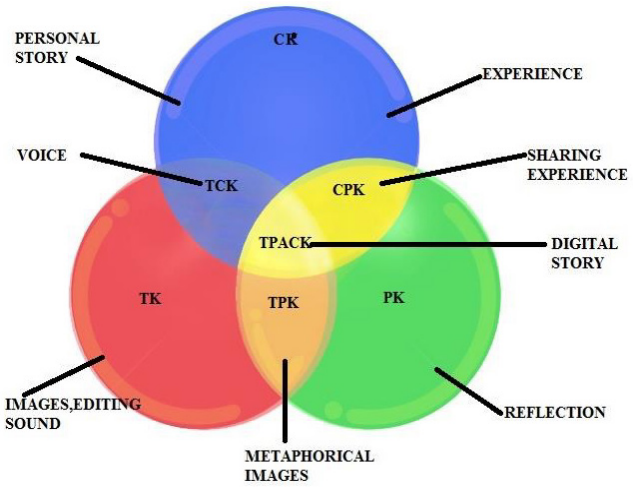

Figure 2. TPACK development based on DS

5.2. Values and Attitudes

All four participating teachers conveyed their beliefs and attitudes by the type of IDS they created and also indicated them in their follow-up RDS. They also voiced their beliefs and attitudes within the reflective story circle. The four teachers integrated personal beliefs into their thinking and actions when creating their IDS, something which Fintan became particularly aware of during the creation of the IDS. He expressed barriers to Digital Storytelling in the style of IDS he created and during the reflective phase when he commented '*It fitted into my lesson plan... but I didn't create a story did I?*'

Iosef's awareness of his classroom management and existing relationship with junior students challenged the benefits of telling stories for instruction. His deviation from the workshop definition of IDS was linked closely to his beliefs and value of storytelling for instruction. He described managing his junior classes with a strictly student /teacher relationship which serves to distance himself as a person outside of the classroom. He sets a clear focus on teaching and learning within those boundaries. His beliefs and classroom management practice with junior students challenged the creative element of the script. Iosef remained satisfied with his use of technology for the Developments topic and the level of engagement and accelerated learning by his students, and he plans to use his personal style of IDS for future classes on the topic of Development. He did not view the creation of a story as a challenge, expressing it was a style which did not fit into his pedagogy for Junior students in his subject and supported this by saying he would consider creating an IDS with a story for senior students in the future. Digital Storytelling did not align with his current PCK.

In contrast, Maeve enjoyed her experience of storying two characters in an office situation, and this has influenced her to plan future stories involving her characters. Maeve described herself as '*not a very creative person',* yet she is creatively developing her future pedagogy in a style which she believes will interest and engage her students with a deeper level of understanding and learning of a subject which has 'changed very little in the last twenty years'. Louk also applied his values and beliefs in story instruction to his IDS, bringing his personal life into the classroom, something with which he is very comfortable. Handal and Lauvas [48] theorize that every teacher has a practical theory of teaching which relates to their experience and values. Personal experience is not merely as an educator but relates back to when being educated. This is particularly true of Louk who references his past educational experiences of storytelling teachers in his school days within his RDS.

5.3. Professional Development

Professional development focused on learning how to create and understand how students can learn through Instructional Digital Story (IDS). Collaborative reflection provided an opportunity to quantify and share what each of the four teachers already knew, and it grounded their observations of current practice before introducing a new technological tool. By voicing their stories of experience and listening to other stories, they reassessed their classroom practice which offered an opportunity to reshape future practice McDrury and Alterio [49].

Together, the four teachers learned the basic process of the seven elements of crafting a good Digital Story Lambert [13]; Ohler [10], with personal emphasis. Each demonstrated their understanding by creating a personal IDS and RDS. The development of technology knowledge (TK) used to digitize stories, and pedagogical use of storying subject content (PCK) was a result of a collaborative working environment. Lave and Wenger [50] maintain that questions which arise from this type of collaborative process draw upon shared expertise and help to make a method more explicit in the context of practice. The unique style of IDS crafted by each teacher and shared in the reflective story circle developed questions among the four teachers with particular reference to the suitability of IDS for their subject, teaching style, beliefs and values. Louk had shared his RDS with Fintan and Iosef and from viewing the style of Iosef's introduction to his RDS evidence of learning from Louk can be seen. Both RDS use images of the teacher in a reflective pose.

The sociality of the process of story circle and the integration of technology involved in Digital Story alongside the nature of narrative inquiry served to nurture professional development across subject domains. This type of collaboration is unique across subjects in the secondary school where the inquiry took place and most probably unique in other secondary schools in Ireland. This relates to hierarchical issues of subjects within a school curriculum.

5.4. Hierarchy of Subjects

Optional subjects such as Business and Design Communications Technology often compete for student numbers and therefore teachers work very closely as a department, to the point of almost becoming insular. Core subjects of Mathematics and English are highly valued because success is crucial to achieving either the junior or Leaving Certificate State examination and may be viewed by some teachers and school management as having higher status on the curriculum. Throughout the process of the inquiry, the four teachers treated all four subjects as having equal value on the curriculum as they shared a common goal of developing TPACK.

5.5. Relationships

Over the professional development process, a sense of connectedness and caring among the group was indicated through sharing of TK outside of the meetings. These factors are highlighted as important in narrative inquiry by Connolly and Clandinin [51] when they say: *'In everyday life the idea of friendship implies a sharing, an interpenetration of two or more persons' spheres of experience. Mere contact is acquaintanceship not friendship. The same can be said for collaborative research which requires a close relationship akin to friendship*'. (p. 281)

The three male teachers developed a relationship parallel to friendship. They collaborated and shared information outside of the story circle, but did not include the female teacher. Maeve treated this casually when she described how she did not make an effort to collaborate with them. Iosef and Maeve teach in classrooms which are located on the same floor of the school and would, therefore, meet regularly. The male teachers informed me how they collaborated during the school day. This inquiry did not lend itself to explore why this happened, but it does highlight the possibility of gender or other issues.

As the inquiry progressed, I listened to and observed the participants and became aware of living their shared stories of Digital Story challenges and difficulties and the fact that both researcher and participant should be heard. I displayed my trust in the group relationship by sharing an RDS I had created based on the inquiry to date. The process of sharing my RDS created further discussion and opened greater avenues of trust within the group. It encouraged the teachers to voice their fears and challenges at a deeper level illustrating the nature of collaboration as part of professional development. All four teachers reported having found collaboration as a group within the school to be a positive experience. They discussed how they chose to collaborate and this influenced their commitment to integrating the technology of Digital Story into their pedagogy. Sharing of experiences inspired Iosef to suggest he would create an IDS with a story plot for senior students, Maeve has been inspired to develop a series of IDS and while Fintan and Louk do not plan to continue unless they are allocated time to do so, they found it a rewarding and enjoyable experience.

6. Conclusions

This Paper has illustrated how links between a community of practice and student learning can be generated in a school setting. It has gained insight into rewards, challenges and concerns of teachers who shared experience of developing TPACK after the creation of Digital Stories through the roles they play in the school curriculum. Rewards included successful experiences of accelerated student learning and feelings of pride in their personal mastery of creating both IDS and RDS. While challenges of time consumed in the creation and personal choice of utilizing DS were balanced through participation in a professional learning community.

The experience of networking became enriched by the curiosity of other teachers within the school. Innovative practice such as IDS inspired other teachers within the school community to ask questions and created further openness to observation and learning. The evolving process of understanding is gained from learning networks and Digital Storytelling encourages collaborative networks through the story circle process. It is during this process that ideas, techniques and challenges which have been overcome are shared. It encourages teachers to discuss and share non-traditional methods of teaching and consider methods '*providing a clear explanation of subject matter, using a*

variety of approaches' (p. 13) ESRI [52].

The experience of the four teachers participating in this inquiry highlighted the integration of technology as a complex issue. As they engaged in a new experience they displayed differing levels of confidence, belief and creative thinking. Based on the ontological beliefs of two teachers, Digital Storytelling as an instructional tool can develop a teachers understanding of TPACK. The interaction of the six elements TK, PK, CK, TPK, TCK, PCK can assist the teacher selecting knowledge in a more strategic and varied way. It can focus the instructional planning in making instructional decisions which has the potential to engage and accelerate student learning. One teacher demonstrated how beliefs do not always match practice when he became influenced by curriculum requirements. This indicates how teachers utilize a particular technology in different ways and TPACK alone does not provide an explanation as to why.

Reflection is a necessary component when learning a new digital media and this assisted in developing an understanding why the participating teachers utilized IDS in different ways. As a reflective tool Digital Storytelling enhances the process of reflection and offers an opportunity for teachers to question their practice. It also maintains a structure for the process of creative thinking and exposes teacher attitudes and sense of self efficacy. The use of personal narrative in creating an RDS encourages teachers to articulate implicit knowledge and reflect on personal experience of bringing together knowledge of technology, content and pedagogy. This suggests a need for further research with experienced teachers

This practitioner based research shows how teachers across the curriculum have the potential to collaborate and share resources, knowledge and creative solutions while developing TPACK. In doing so, they can establish a community of practice (CoP) with a particular focus, such as IDS, within a larger community of teachers. The contribution of this research to learning environments within a domestic school setting has illustrated how educational thinking and practice across subject disciplines can be altered.

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An Evaluation of Service Quality in Higher Education: Marmara and Niğde Omer Halisdemir Universities' Department of Education Students

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Abstract The purpose of this research is to evaluate the quality service in higher education in Marmara and Niğde Omer Halisdemir Universities' department of education students. This study was prepared using a screening model from quantitative research methods. The sample of this research comprised 886 university students attending the higher education institutions mentioned. The Scale of Service Quality in Higher Education Institutions is composed a data collection tool consisting of 28 items and 6 factors. The data of this research were collected during the 2016-2017 academic year. Gender, grade, university, and academic success were utilized in this study as personal variables. In the results of this study, the considerations of girls were higher than males regarding the academic position and institutional image. In addition, the perceptions of 3rd grade students were higher than those of 4th grade students according to academic position, institutional image, offered diploma programs, and physical opportunities. On the other hand, the academic success of university students was increased regarding all factors and total scores.

Keywords Service Quality, Higher Education, Education Faculty

1. Introduction

Globalization and technological developments today affect Turkey as well as all countries of the world. Adapting to such rapid changes require concentrated efforts. In order to adapt to all of the current global changes, the universities are in the first place to evoke change. Quality universities are the converters of the nations in exchange.

The concept of quality comes from a Latin word *qualitas*. Different definitions of this concept have been formed. The quality can be defined briefly as "compliance with standards". Furthermore, quality includes the elements of a product or service that will create a sense of satisfaction by meeting the basic needs of the target group with the different features it contains [1]. According to [2], "quality signifies also the conformity to the requirements of a product." It is possible to state that these requirements or standards meet the criteria for quality assurance if they are considered to be expressed as standards in the previous definition.

On the other hand, according to [3], quality is defined also as "a set of properties that include the ability of a good or service to deal with a particular need". The expression of the need for this definition also indicates requirements/standards or certain criteria. Also, quality determines how one might "create, design, produce, and provide after-sales services of the most economical, most usable, and always satisfying quality products" [4].

The importance of service quality in higher education has been gradually realized [5], and the role of service quality in higher education has attracted increased attention in the last two decades [6]. Higher education institutions must determine their needs and demands, as students are stakeholders and customers in this setting, and customer satisfaction is attached to service quality. Figure 1 shows the key stakeholder categories in higher education institutions as follows:

Figure 1. Higher education institution key stakeholder categories

Reference: [7]

As indicated in Figure 1, the key stakeholder categories in higher education institution include people and organizations such as the employees, government, ministry, industry, management, donors and financial institutions, competitors, suppliers, and students within the local community.

The development of higher education service quality was attached to the organization's ability to ensure an overall climate and culture for change through its various decision-making and operating systems and human resource activities [8]. In higher education literature, [9] and [10] determined that students' perceived service quality is an antecedent to student satisfaction. In addition, the positive perceptions of service quality can provide student satisfaction, and satisfied students may then attract new students by engaging in positive word-of-mouth communication with acquaintances and friends, and they may return to the university to take other courses and other training programs [11]; [12]; [13]; [14]. Students' satisfaction has a positive influence on fundraising and student motivation [15].

While the subject of this research is higher education institutions, the service recipients are the customers, which are the students. The academic staff and other employees may also be considered service recipients. The quality elements in higher education are organized into six subcategories [12]:

(1) Concrete elements,
(2) Qualification,
(3) Attitude,
(4) Content,
(5) Presentation, and
(6) Reliability.

The concrete elements include equipment and facilities, modern equipment and facilities to facilitate transportation, good environmental support services (such as housing, sports, social services etc.), and adequate academic staff. The staff members demonstrate qualifications such as communication skills. Attitude shows also the individual ability to understand the needs of students, willingness to help, availability for help, and counseling. The content brings to the programs the students' future work, validity, computer use, communication skills, and teamwork. Effective presentation must involve consistency, impartiality of exams, feedback from students, and encouragement of students. Reliability is the capacity to stop talking, evaluate complaints, and solve problems [16]. Quality in higher education can be determined with five criteria: technique, process, infrastructure, interaction, and atmosphere [17]. Taking all these factors into consideration, it is understood that many factors must be present in order to be qualified to offer successful customer service in higher education.

In the 21st century, the demand for university services has increased in every respect. A growing number of students are seeking education in good universities. Along with this increase in demand, the universities are producing more information and spreading the information through global opportunities. Therefore, as it is throughout the world, anxiety regarding quality in higher education is rising rapidly in Turkey. The number of students has rapidly increased with the rise in the number of universities and quotas opened in Turkey since the 1990s. However, the number of faculty members did not increase in parallel with the number of students, and the inadequacy of resources such as libraries and laboratories were brought to the agenda [18]. As with every institution, higher education institutions should also try to prove their quality in today's competitive world, where each innovation is rapidly spread and internalized, thus increasing the qualifications of such institutions. It is important that these institutions not only try to increase their qualifications on their own but also obtain the approval of commissions established for this purpose.

Quality evaluation in higher education in Turkey is being carried out by the Higher Education Academic Evaluation and Quality Improvement Commission, which is located in the Council of Universities. The aim of the commission in this regulation is to determine the strategies, processes, procedures, and principles related to the evaluation of academic and administrative services of higher education institutions; ensure the development of qualifications; and obtain the approval and recognition of quality levels in line with the strategic plan and goals of the Higher Education Council, and to update them when necessary and to inform higher education institutions that are situated in [19]. In this sense, it is noteworthy that established universities, institute quality, pass quality evaluations, and become branded in the world. These universities realize their quality improvement by taking into account what their future needs may be.

Under this concept, universities today are referred to as "Third-Generation Universities". These universities have a multi-functional structure to carry out research tasks as well as provide classes. If education is long term and quite expensive and errors are made, it seems natural to consider a number of factors in order to capture quality when the results are expected to take a long time to be realized. To address the required tasks, Turkey participated in a higher education quality project called the European Higher Education Area [20].

Since 2001, the training programs for "Leonardo," "Socrates," and the "Bologna Declaration," which were launched in the European Union, were organized in Turkey. Under this concept, the curriculums of the faculties in the universities were reorganized and were undergoing plans to be improved. This project sought to establish diplomas and teaching periods, with lifelong learning and common credits that can be applied all over the world. Thus, the harmonization of the European Credit Transfer System (ECTS) of all countries is supported. The ECTS aims to create field competencies and national qualifications ([20]. All these initiatives are evidence of their quest for quality.

It is important for universities to determine how much they

can respond to the needs of the modern world and how their services are evaluated by the service providers. Therefore, this study may provide useful information that should be taken into consideration for the university administrations that conduct the research. For these reasons, this study was structured to determine how the students of Marmara and Niğde Omer Halisdemir Universities' education faculties evaluate their quality of service and take into consideration their existing situation, consider improving or increasing their quality of services, and determine the future strategies according to their students.

2. Method

The qualitative method and screening model were used in this research in order to investigate the perceptions of service quality in higher education in Marmara and Niğde Omer Halisdemir Universities' education students according to their gender, grade level, university, and success in classes. The screening model can be defined as research that is usually conducted on larger samples than the other studies are, while determining the participants' opinions or interests, skills, abilities, attitudes, etc., about a topic or event [21]

2.1. Data Collection Tools

In this study, the Personal Information Form was used to determine the gender, grade level, university, and course success levels of the students participating in the research. In addition, the Scale of Service Quality in Higher Education Institutions by Bektaş & Akman (2013) was utilized for reliability and reliability calculations. In this study, the data were collected during the 2016-2017 academic year. This scale constituted of 28 items and a 5-item Likert-type scale. According to the validity studies of the scale, the BMD/KMO value is 0.893. The Cronbach Alpha values of the sub-factors and the reliability analysis are as follows [22]:

(1) First Factor: Institutional Administrative direction (10 items–Cronbach Alpha: 0.852);
(2) Second Factor: Institutional academic direction (6 items–Cronbach Alpha: 0.712);
(3) Third Factor: Institutional image (3 items-Cronbach Alpha: 0.870);
(4) Fourth Factor; Accessibility (3 items-Cronbach Alpha: 0.762);
(5) Fifth Factor: Diploma programs offered by institution (3 items-Cronbach Alpha: 0.717) and
(6) Sixth Factor: Institutional physical facilities (3 items-Cronbach Alpha: 0.761).

2.2. Scope and Sample

The sample of this study constitutes 886 students studying at Marmara and Niğde Omer Halisdemir Universities in the education faculties of the primary, maternity, social studies, mathematics, and science teaching departments. The appropriate sampling method was used when determining the sample of this study. With this type of sampling, the researcher created a sample with the most accessible responders to best achieve a representative group and maximize savings [23].

Table 1 shows the information about the sample of the study.

Table 1. Frequency and percentage of the distribution of students

	f	%		f	%		f	%
Scope			**Scope**			**Scope**		
Gender			**University**			**Grade**		
Female	742	75.6	Marmara University	496	50.5	3rd grade	521	53.1
Male	240	24.4	Niğde Omer Halisdemir University	394	49.5	4th grade	461	46.9
Total	**886**	**100.0**	**Total**	**886**	**100.0**	**Total**	**886**	**100.0**
Department	**f**	**%**	**Success Level**	**f**	**%**			
Maternity instructor	96	29.5	Weak	30	3.1			
Primary instructor	290	19.6	Medium	697	71.0			
Social Sciences Education	194	19.8	Good	255	26.0			
Science Education	156	15.9	**Total**	**886**	**100.0**			
Mathematics Education	150	15.3						
Total	**886**	**100.0**						

According to Table 1, in the scope group, 742 students were female, 240 students were male, 496 were studying at Marmara University, and 394 students were trained at Niğde Omer Halisdemir University students. 521 students were educated for the 3rd grade level, and 461 were trained for the 4th grade level. 96 students in the department were maternity instructors, 290 students were in the department of primary instruction, 194 students in the department of Social Sciences Education, 156 were students in the department of science education, and 150 students were educated in the department of mathematics education. Finally, it was determined that 30 students had weak academic progress, 697 had medium success levels, and only 255 students had good results regarding their academic success.

3. Findings

The findings of this research were showed below.

T-test analysis findings about service quality in higher education related to the gender variables

The t-test analysis findings about service quality in higher education related to the genders variables are shown in Table 2.

Table 2. T-test analysis results of service quality in higher education related to the gender variables

	Gender	N	Mean	ss	t	df	Sig.
Total	**Female**	672	3.0271	.53338	2.732	884	.006
	Male	214	2.9112	.56200			
Factor 1 Institutional administrative direction	**Female**	672	3.0568	.69519	3.05	884	**.002***
	Male	214	2.8869	.74941			
Factor 2 Institutional academic direction	**Female**	672	3.6699	.65155	3.605	884	**.000***
	Male	214	3.4836	.67839			
Factor 3 Institutional image	**Female**	672	2.6503	1.21367	1.156	884	.248
	Male	214	2.5421	1.12590			
Factor 4 Accessibility	**Female**	672	2.9578	.87392	1.792	884	.074
	Male	214	2.8318	.96347			
Factor 5 Diploma programs offered by institution	**Female**	672	2.7455	.90145	-1.063	884	.310
	Male	214	2.8224	.98271			
Factor 6 Institutional physical facilities	**Female**	672	2.3700	.88948	-.203	884	.851
	Male	214	2,3847	1.02700			

*p <.05

As indicated in Table 2, when the students' perceptions of service quality are examined in terms of the differentiation related to their genders, it is determined that, among the six sub factors, the perceptions of girls are higher than the boys in only two factors (Factor 2: Institutional academic direction and Factor 3: Institutional Image).

T-test analysis findings about students' perceptions in service quality in higher education related to the grade variables

The t-test analysis findings about students' perceptions of service quality in higher education related to the grades variables were gathered in Table 3.

Table 3 presents the students' perceptions of service quality in higher education differentially or not related to the grades. The 3rd grade students had higher perceptions than the 4th grade students regarding factors such as institutional administrative direction (Factor 1), institutional academic direction (Factor 2), institutional image (Factor 3), diploma offered by the institution (Factor 5), and institutional physical possibilities (Factor 6). The 3rd grade perceptions were also higher in total.

T-test analysis findings about students' perceptions of service quality in higher education related to the universities variables

The t-test analysis findings regarding students' perceptions of service quality in higher education related to the university variables are shown in Table 4.

Table 3. T-test analysis results of students' perceptions of service quality in higher education related to the grade variables

	Grade Level	N	Mean	ss	t	df	Sig.
Factors Total	**3rd grade**	400	3.0813	.52131	5.043	884	**.000***
	4th grade	486	2.8992	.55129			
Factor 1 Institutional administrative direction	**3rd grade**	400	3.1887	.70510	8.264	884	**.000***
	4th grade	486	2.8058	.66283			
Factor 2 Institutional academic direction	**3rd grade**	400	3.6951	.61047	3.499	884	**.000***
	4th grade	486	3.5396	.71233			
Factor 3 Institutional image	**3rd grade**	400	2.4883	1.24215	-3.762	884	**.000***
	4th grade	486	2.7892	1.11057			
Factor 4 Accessibility	**3rd grade**	400	2.9925	.82414	2.385	884	.017
	4th grade	486	2.8483	.97436			
Factor 5 Diploma programs offered by the institution	**3rd grade**	400	2.8471	.96546	2.965	884	**.003***
	4th grade	486	2.6633	.85611			
Factor 6 Institutional physical facilities	**3rd grade**	400	2.4122	.92264	1.372	884	**.000***
	4th grade	486	2.3267	.92459			

*p <.05

Table 4. T-test analysis results of service quality in higher education related to the universities variables

	University	N	Mean	ss	t	df	Sig.
Factors Total	**Marmara University**	496	2.9950	.51950	-.257	884	.797
	Niğde Omer Halisdemir University	390	3.0044	.57080			
Factor 1 Institutional administrative direction	**Marmara University**	496	3.0063	.67953	-.450	884	.657
	Niğde Omer Halisdemir University	390	3.0279	.75190			
Factor 2 Institutional academic direction	**Marmara University**	496	3.6428	.63462	.907	884	.370
	Niğde Omer Halisdemir University	390	3.6021	.69665			
Factor 3 Institutional image	**Marmara University**	496	2.5477	1.19725	-2.155	884	.031
	Niğde Omer Halisdemir University	390	2.7214	1.18274			
Factor 4 Accessibility	**Marmara**	496	2.8757	.90714	-1.937	884	.053
	Niğde Omer Halisdemir	390	2.9932	.88173			
Factor 5 Diploma programs offered by the institution	**Marmara University**	496	2.7379	.89284	-.954	884	.340
	Niğde Omer Halisdemir University	390	2.7974	.95739			
Factor 6 Institutional physical facilities	**Marmara University**	496	2.4852	.95617	4.091	884	**.000***
	Niğde Omer Halisdemir University	390	2.2316	.86188			

*p <.05

As shown in Table 4, the students' perceptions of service quality in higher education are determined differentially or not related to the universities. In only the sixth sub-factor (Factor 6: Institutional physical facilities) the students' perceptions of service quality in higher education institution trained in Marmara University were higher than those of Niğde Omer Halisdemir University students.

ANOVA and Scheffe analysis findings about service quality in higher education related to the success levels variables

The ANOVA and Scheffe analysis findings about service quality in higher education related to the success levels variables are provided in Table 5.

Table 5. ANOVA analysis findings about service quality in higher education related to the success levels variables

Success Levels	Source of variance	Sum of squares	sd	Mean Square	F	Sig.
Factor 1 Institutional administrative direction	**Between Groups**	6.781	2	3.391	6.776	.001*
	Within Groups	441.817	883	.500		
	Total	448.599	885			
Factor 2 Institutional academic direction	**Between Groups**	3.877	2	1.939	4.451	.012*
	Within Groups	384.633	883	.436		
	Total	388.510	885			
Factor 3 Institutional image	**Between Groups**	37.895	2	18.948	13.687	.000*
	Within Groups	1222.392	883	1.384		
	Total	1260.288	885			
Factor 4 Accessibility	**Between Groups**	10.435	2	5.217	6.559	.001*
	Within Groups	702.338	883	.795		
	Total	712.773	885			
Factor 5 Diploma programs offered by the institution	**Between Groups**	37.181	2	18.590	22.967	.000*
	Within Groups	714.740	883	.809		
	Total	751.921	885			
Factor 6 Institutional physical facilities	**Between Groups**	18.158	2	9.079	10.871	.000*
	Within Groups	737.407	883	.835		
	Total	755.564	885			
Factors Total	**Between Groups**	5.421	2	2.710	9.388	.000*
	Within Groups	254.933	883	.289		
	Total	260.354	885			

*p<0.05

Table 5 shows that the perception of students in perceptions of service quality in higher education varies according to the success levels. The differentiation in success level represented in the Scheffe Analysis is shown in Table 6 below.

Table 6. Scheffe analysis findings about service quality in higher education related to the success level variables

Successes Levels	(I) Success level	(J) Success Level	Medium (I-J)	Std Error	p
Factor 1 Institutional administrative direction	Weak	Medium	-.45276*	.13673	.004*
		Good	-.34802*	.14091	.048
	Medium	Weak	.45276*	.13673	.004*
		Good	.10474	.05302	.143
	Good	Weak	.34802*	.14091	.048
		Medium	-.10474	.05302	.143
Factor 2 Institutional academic direction	Weak	Medium	-.38056*	.12758	.012*
		Good	-.36111*	.13147	.023
	Medium	Weak	.38056*	.12758	.012*
		Good	.01945	.04947	.926
	Good	Weak	.36111*	.13147	.023
		Medium	-.01945	.04947	.926
Factor 3 Institutional image	Weak	Medium	-.34818	.22743	.310
		Good	-.77116*	.23438	.005*
	Medium	Weak	.34818	.22743	.310
		Good	-.42298*	.08819	.000*
	Good	Weak	.77116*	.23438	.005*
		Medium	.42298*	.08819	.000*
Factor 4 Accessibility	Weak	Medium	-.60286*	.17239	.002*
		Good	-.63889*	.17766	.002*
	Medium	Weak	.60286*	.17239	.002*
		Medium	-.03603	.06685	.865
	Good	Weak	.63889*	.17766	.002*
		Medium	.03603	.06685	.865
	Medium	Weak	-.63889	.17766	.002*
		Good	.03685	.06732	.850
	Good	Weak	.42298*	.08819	.000*
		Medium	.03603	.06685	.865
Factor 5 Diploma offered by the institution	Weak	Medium	-.24375	.17391	.375
		Good	-.67725*	.17922	.001*
	Medium	Weak	.24375	.17391	.375
		Good	-.43350*	.06744	.000*
	Good	Weak	.67725*	.17922	.001*
		Medium	.43350*	.06744	.000*
Factor 6 Institutional physical possibilities	Weak	Medium	-.58219*	.17665	.005*
		Good	-.33201	.18204	.190
	Medium	Weak	.58219*	.17665	.005*
		Good	.25018*	.06850	.001*
	Good	Weak	.33201	.18204	.190
		Medium	-.25018*	.06850	.001*
			-.45276*	.13673	.004*
Factors Total	Weak	Medium	-.43364*	.10386	.000*
		Good	-.46088*	.10704	.000*
	Medium	Weak	.43364*	.10386	.000*
		Good	-.02724	.04028	.796
Total	Good	Weak	.46088*	.10704	.000*
		Medium	.02724	.04028	.796

*p<0.05

Table 6 shows that, in the first sub-factor, (institutional administrative direction), there was a significant difference in the level of p <.05 between the students with a weak success level and those with medium and good success levels. In addition, in this first factors, a significant difference was found in the p <.05 level in favor of the students with a medium success level between the medium- and weak-level students. In addition, in this first factor, there was a significant difference in the level of p <.05 in favor of the good and weak success-level students.

Examination of Table 6 reveals that, in the second sub factor (institutional academic direction), there was a significant difference in the level of p <.05 between students with a weak success level and students with medium and good success levels. In addition, in this first factor, a significant difference was determined at the p <.05 level in favor of the students with a medium success level between the medium and the weak level students. Furthermore, regarding this first factor, there was a significant difference in the level of p <.05 in favor of students with good and weak success levels.

Table 6 shows that, in the third sub factor (institutional image), there was a significant difference in the level of p <.05 between students with a weak success level and students with medium and good success levels. In addition, regarding this first factor, a significant difference was found at the p <.05 level in favor of the students with a medium success level between the students at medium and weak levels. For the first factor, there was a significant difference in the level of p <.05 in favor of students with good and weak success levels.

In this scale cited above, in the fourth sub factor (accessibility), there was a significant difference in the level of p <.05 between students with a weak success level and students with medium and good success levels. In addition, in this first factor, a significant difference was determined in the p <.05 level in favor of the students with medium success levels between the students at medium and weak levels. For this first factor, there was a significant difference in the level of p <.05 in favor of good and weak success level students'.

In this scale, in the fifth sub factor (diploma offered by the institution), there was a significant difference in the level of p <.05 between students with a weak success level and students with medium and good success levels. In addition, for this first factor, a significant difference was found in the p <.05 level in favor of the students with a medium success level between the students with medium and weak levels. In addition, regarding the first factor, there was a significant difference in the level of p <.05 in favor of students with good and weak success levels.

In this scale, in the sixth sub factor (institutional physical possibilities), there was a significant difference in the level of p <.05 between students with a weak success level and students with medium and good success levels. In addition, in this first factor, a significant difference was revealed in the p <.05 level in favor of the students with a medium success level between the students with medium and weak levels. Furthermore, in this first factor, there was a significant difference in the level of p <.05 in favor of students with good and weak success levels.

In the factors of this scale, there was a significant difference in the level of p <.05 between students with a weak success level and students with medium and good success levels. In addition, in this first factor, a significant difference was found in the p <.05 level in favor of the students with a medium success level between the students with medium and weak levels. Regarding this first factor, it was determined that there was a significant difference in the level of p <.05 in favor of students with good and weak success levels.

4. Results

The results of this research are summarized below:

(1) Among the six sub factors, in only two factors (Factor 2: Institutional academic direction and Factor 3: Institutional Image), the perceptions of girls regarding service quality in higher education were higher than the boys.

(2) The 3rd grade students had higher-level perceptions than the 4th grade students of service quality in higher education in some factors, such as institutional administrative direction (Factor 1), institutional academic direction (Factor 2), institutional image (Factor 3), diploma offered by the institution (Factor 5), and institutional physical possibilities (Factor 6).

(3) Among all six sub-factors, in only the sixth sub factor (Factor 6: Institutional physical facilities) were the students' perceptions of service quality in higher education institutions at Marmara University determined to be higher than those of Niğde Ömer Halisdemir University students.

(4) When the success levels of university students increase, their perceptions of service quality in higher education can improve directly in all sub factors and total factors of this scale.

The perception of service quality in higher education is higher in third grade than in fourth grade. Regarding this concept, it is seen that the perception of higher education service quality decreases among the students in the fourth grade. This result can be produced because of the program. When the programs are examined, it can be interpreted that the courses related to the profession take place in the third grade more, and it does not affect the perception of the third grade students. In this case, it can be argued that the students were in the final year due to their focus on KPSS.

Also, it can be determined that the students of Marmara University have a better chance of evaluating the physical possibilities of the university because they have access to the cultural richness of Istanbul, and the campus is in a central position.

On the other hand, according to the results, when the success level of the university students increases, their perceptions of service quality in higher education rise. The students who had weak success levels perceived weak service quality in higher education in some sub factors, such as institutional administrative and academic directions, institutional image, accessibility, diploma offered by the institution, and also institutional physical possibilities. This is a thought-provoking result. It is possible to make an interpretation that the expectations of the students with weak achievement level are increasing.

4.1. Discussions

The students' perceptions of service quality in higher education institutions indicated a significant difference according to the year of the universities' establishment. Significant differences were observed in the sub factors of service quality perceptions, such as institutional image, diploma programs offered by the institution, and also institutional physical possibilities [21].

According to the results of the present study, female students in Marmara and Niğde Ömer Halisdemir Universities in the education faculty produced evaluations at a higher level than males according to the institutional academic direction and image in terms of service quality perception higher education. Similarly, in the study conducted by [24], the perceptions of female students were found to be higher regarding some sub factors than males. But, on the other hand, the perceived quality of service among the students who graduated from different higher education institutions receiving pedagogical formation in Necmettin Erbakan University by [21] did not show any significant difference according to gender.

The present study determined that all students trained in 3rd grade in the related universities had a higher level of education than 4th grade in terms of perceptions of service quality in higher education in five sub factors, not only in the fourth sub factor of this scale. Similarly, there is a significant difference in the grades of university students in perceptions of service quality in higher education in terms of temporal, conceptual, and structural sub factors of the study conducted by [24] in a similar way in the higher education service quality perceptions of students at Manchester University in the USA higher education institutions compared to their grade levels. In another work of research by [25], there is a significant difference in their grades of university students in terms of perceptions of service quality perceptions in higher education in terms of implementation processes, expectations, and physical possibilities according to the grade variable of the students in Matej Bel and Belgrade Universities. Furthermore, in the study conducted by [26] in the Çanakkale 18 March University were found significant differences between students' grades and their perceptions of service quality in higher education. In this framework, the findings of the studies mentioned in our study represent similar results in the grade level variable of the students differentiating in perceptions in perceptions of service quality in higher education with the different sub factors explained above.

In the present study, Marmara University has received a better evaluation than Niğde Ömer Halisdemir University in terms of the physical possibilities of the institution for better service quality. Similarly, [27] examined North African universities and determined that the perceptions of service quality in higher education changed according to the universities in terms of physical possibilities.

The significant difference was determined in all sub factors in perceptions of service quality in higher education according to the success levels of the students.

In the studies by [28] and [24] within the scope of international research, the perceptions of service quality in higher education showed significant differences regarding many sub factors in higher education according to their students' success levels. At the same time, in the study conducted by [26], the significant differences were found between the success levels of the students and the perceptions of service quality in higher education in some sub factors of higher education institutions.

4.2. Recommendations

In conclusion, the suggestions are expressed below:

(1) One of the most important goals of our university's undergraduate program for teaching education should be to improve the perceptions of service quality in higher education.
(2) Maximum improvements may be proposed to improve the existing conditions in the universities. Measures may be increased according to the satisfactions of male students, especially in terms of academic direction and image of education.
(3) Precautions should be taken to ensure that the academic background/level of success of employees have the knowledge and experience that can provide and support the expectations of the weakest students.
(4) The universe may include higher education institutions in a specific province or region instead of two higher education institutions.
(5) The research method can be organized in quantitative, qualitative, and also mixed methods.
(6) More detailed information on each sub factor in perceptions of service quality in higher education can be obtained through qualitative research methods.

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Internet-based French as a Foreign Language Vocabulary Learning: Academic Success and Opinions on FFL Learners

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Abstract In the 21st century, globalization and technological developments in different domains of life have accentuated the importance of multilingualism and multiculturalism in studying English and French as foreign languages in different countries of the world, including Turkey. This research is aimed at determining the effects of learning vocabulary in French as a foreign language (FFL) through internet-based study. This study used a mixed-method (quantitative and qualitative) approach. In the 2016-2017 academic year, 85 Turkish university students (in 20-23 ages) participated in this study. A vocabulary test and a semi-prepared interview form are prepared to collect the data for this research. In this study, Turkish university students studying vocabulary using internet-based research justify their ability to improve French language knowledge easily and efficiently.

Keywords Internet-based Learning, Studying Vocabulary, FFL University Students

1. Introduction

Many aspects of the modern world are influenced by the developments in technology, politics, economics, education, etc...This period is deemed as the century of information, globalization and communication. In such a setting, teaching and learning foreign languages can permit every citizen to form a solid future for him- or herself and also for his or her family and his or her country. The next generations can easily acquire and transfer their knowledge from their native tongue to a foreign language(s). The language contact-contrast dynamics can therefore be viewed as a solid building block that allows a learner to structure the acquisition and transmission of knowledge. For these reasons, multilingualism can be used as a tool in the construction of wide-broaded knowledge. Multilingualism and multiculturalism can be developed using a didactic approach restructured through an essentially sociolinguistic conceptualization, reformed by the learner's role of speaker-as-actor [1].

Today, due to the influence of the world-wide phenomenon, English is the first foreign language that everybody seeks to learn. After English, French is the second foreign language to learn, as approximatively 200.000.000 people in 5 continents speak French. Teaching English and also French allows to everybody to find new opportunities in their professional lives. Multilinguism offers individuals new opportunities in national and also international companies [2]. That's why citizens of Turkey, as in other countries in the world, try to learn French as a foreign language (FFL) after English.

There are 35 official and 185 recorded languages within the Council of Europe's 43 member states (Daoust, 1997). Protecting these linguistic and cultural differences while assuring the communication, interaction, and mobility within a forming European Union and across all of Europe, lead to the elaboration of the CEFR (Heyworth, 2004). The aims of Common European Framework are cited below [3]:

(i) *"To promote and facilitate co-operation among educational institutions in different countries;*
(ii) *To provide a sound basis for the mutual recognition of language qualifications;*
(iii) *To assist learners, teachers, course designers, examining bodies, and educational administrators to situate and co-ordinate their efforts".*

The Common European Framework of Reference (CEFR) was published by the Council of Europe in 2001. According to [4], "the CEFR is a descriptive scheme that can be formed to build L2 learners' needs, compose L2 learning objectives, guide the elaboration of L2 learning materials and activities, and assure orientation for the assessment of L2 learning data". The CEFR is structured by six levels of language proficiency (A1 (Breakthrough), A2 (Waystage), B1 (Threshold), B2 (Vantage), C1 (Effective Operational

Proficiency), and C2 (Mastery)), referred to as Common Reference Levels (CRLs), which are "appropriate to the organization of language learning and the public recognition of achievement" (Council of Europe, 2001: 22-23, Introductory guide to the Common European Framework of Reference (CEFR) for English language teachers). The CEFR is structured with five foreign language skills: reading, writing, listening, spoken interaction, and spoken production [2].

This research is formed at the A1 (Breakthrough) language level. This is the first language level in 6 language levels of *CEFR* in which [3] "*the learner can understand and use familiar everyday expressions and very basic phrases aimed at the satisfaction of needs of a concrete type. He/she can introduce him/herself and others and can ask and answer questions about personal details such as where he/she lives, people he/she knows and thing he/she has. He/she can interact in a simple way provided the other person talks slowly and clearly and is prepared to help."*

Vocabulary knowledge is very important for language learners. Teaching vocabulary learning strategies can be very productive when teaching vocabularies. There are five steps in most of the vocabulary learning strategies [5]:

(i) "Facing the word,
(ii) Getting an image of the word in mind,
(iii) Learning the meaning,
(iv) Making a strong connection between form and meaning and
(v) Using the word."

Under this concept, many researchers have studied diverse aspects of vocabulary learning methodologies and the use of CEFR in foreign language classrooms ([6]; [7]; [8]; [9]; [10]; [11]; [12]; [13]; [14]; [15]; [16]; [17]; [18]; [19]; [20]; [21]; [22]; [23]; [24]; [25]; [26]; [27]; [28]; [29]; [30]; [31]; [32]; [33]; [34]; [35]; [36]; [37]; [38]; [39]; [40]; [41]; [42]; [43]; [44]; [45]; [46]; [47]; [48]; [49]; [50]; [51]; [52]; [53]; [54]; [55]; [56]).

The scheme below represents the users/learners' competences during the teaching of foreign language(s):

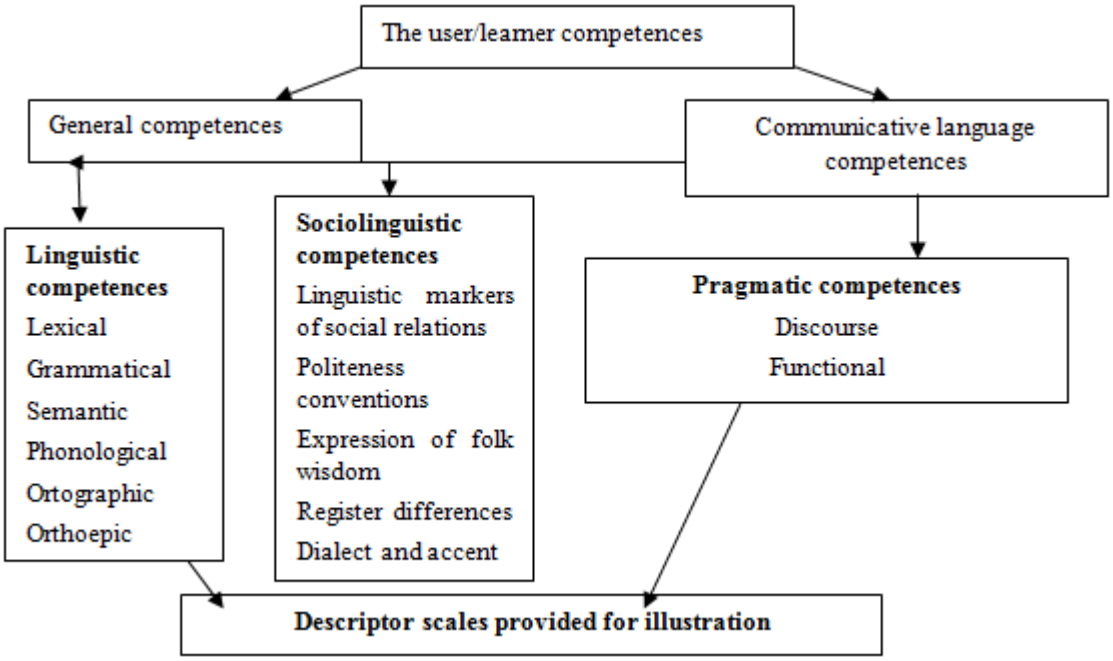


Figure 1. Language use and user/learner competence

References: [2].

As seen in Figure 1, linguistic competences which include lexical, grammatical, semantic, and phonological competences (awareness) are essential aspects among the user/learner competences. Thus, as demonstrated in this article, during the teaching of foreign language(s), linguistic competences are very valuable for user/learner competences. This article proposes to benefit the linguistic competences containing lexical and grammatical competences (awareness) during the teaching of foreign languages. Also, it describes how one can profit from the linguistic competences during these activities in teaching foreign languages.

This article aims to analyze the learner linguistic competences during the teaching action of learning French as a foreign language (FFL).

1.1. Studying Vocabulary While Teaching Foreign Languages

"Knowing a word" actually *"involves a lot more than might be imagined at first, as it contains understanding its meaning (for example its denotation, but also any figurative meaning it may have), knowing how to spell and pronounce it, what part of speech it is, which words it collocates with, how formal or informal it is, which context to use it in, what connotations it has, if prefixes and/or suffixes can be added to it to form new words, if it can be used in compounds, and even knowing its synonyms, antonyms, and sometimes origin" [57]*. According to this perspective, the study of vocabulary acquisition is listed below [58]:

(i) "Order of acquisition of different types of knowledge (morphological, syntactic, collocational, semantic, etc.) for each lexical item;
(ii) Order of acquisition of word classes (noun, verb, adverb, adjective, etc.);
(iii) Order of acquisition of particular lexical items; and
(iv) Developmental stages of lexical processing."

According to [59], vocabulary learning strategies include knowledge about the mechanisms (processes, strategies) used in order to learn vocabulary as well as the steps or actions taken by students:

(i) *To find out the meaning of unknown words;*
(ii) *To retain them in long-term memory;*
(iii) *To recall them at will; and*
(iv) *To use them in oral or written mode.*

As explained by [60], vocabulary knowledge is developed in three major stages:

(i) The first stage involves associative learning, in which a student learns the definition of the word in only one particular context, such as through dictionary use.
(ii) The second is the comprehensive level at which a student understands the word and that word can be expanded upon because the student tries to study synonyms, antonyms, classification, analogies, and connotative dictionary meanings.
(iii) The third stage is the generative level at which learners can use any variation of the word significance independently in their speaking and writing; therefore, they can understand the word used in any context.

In Turkey, while learning foreign languages, for example during the action of studying French as a foreign language (FFL), grammar and vocabulary are essential parts of teaching FFL. Vocabulary has been a main component of foreign languages in FFL classrooms since 1980. Audio-lingual, direct, natural, suggestopedia, and grammar-translation methods are also applied in foreign language instruction to help learners develop a solid knowledge of vocabulary [61].

2. Method

This study collected the data using a mixed-method approach (quantitative (semi-prepared interview form) and qualitative researching methods (vocabulary test)). The design in question is analyzed through the collection and investigation of quantitative data in a first phase of research and is structured by the collection and observation of the consequences of qualitative data in the second phase, which is constructed on the analysis of the initial quantitative results [62].

2.1. Sample

The sample of this research is composed of 100 Turkish university students (63 girls and 37 boys in 20-23 ages) at Marmara University in Istanbul, Turkey, during the 2016-2017 academic year. The students were in 3rd grade in the English teaching department. They studied French as a second foreign language for two hours per week and obtained a nearly A2 language level in French. This study constitutes of Internet-based vocabulary learning. The FFL learners tried to study vocabulary related to the family through Internet-based vocabulary study. This research is built by the application of the Internet site www.lexique.fle.fr for the FFL classroom [63].

2.2. Vocabulary Test

The vocabulary test was prepared with 3 questions worth 100 points. The first question prompted students to list the members of the family, worth 10 points. The second question required them to form sentences using 5 family words, worth 30 points. Finally, the third question prompted them to present their family using a minimum of 100 words and 10 sentences, worth 60 points.

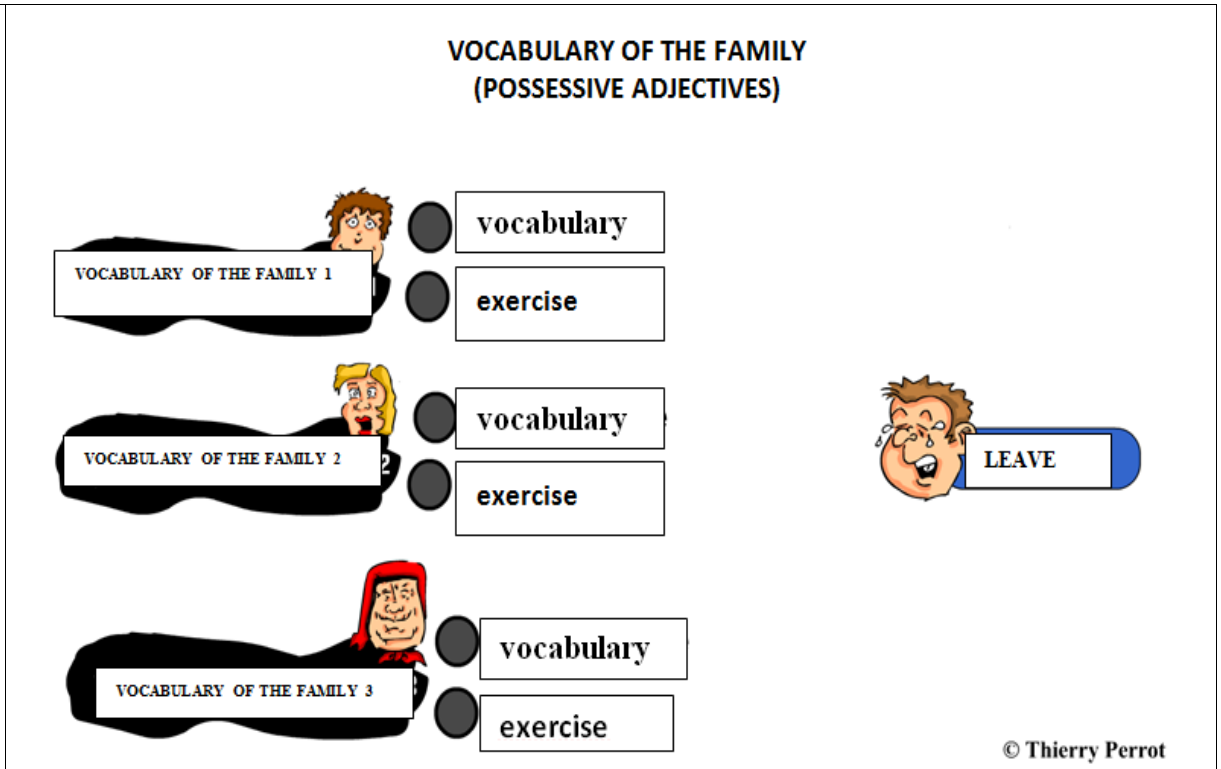
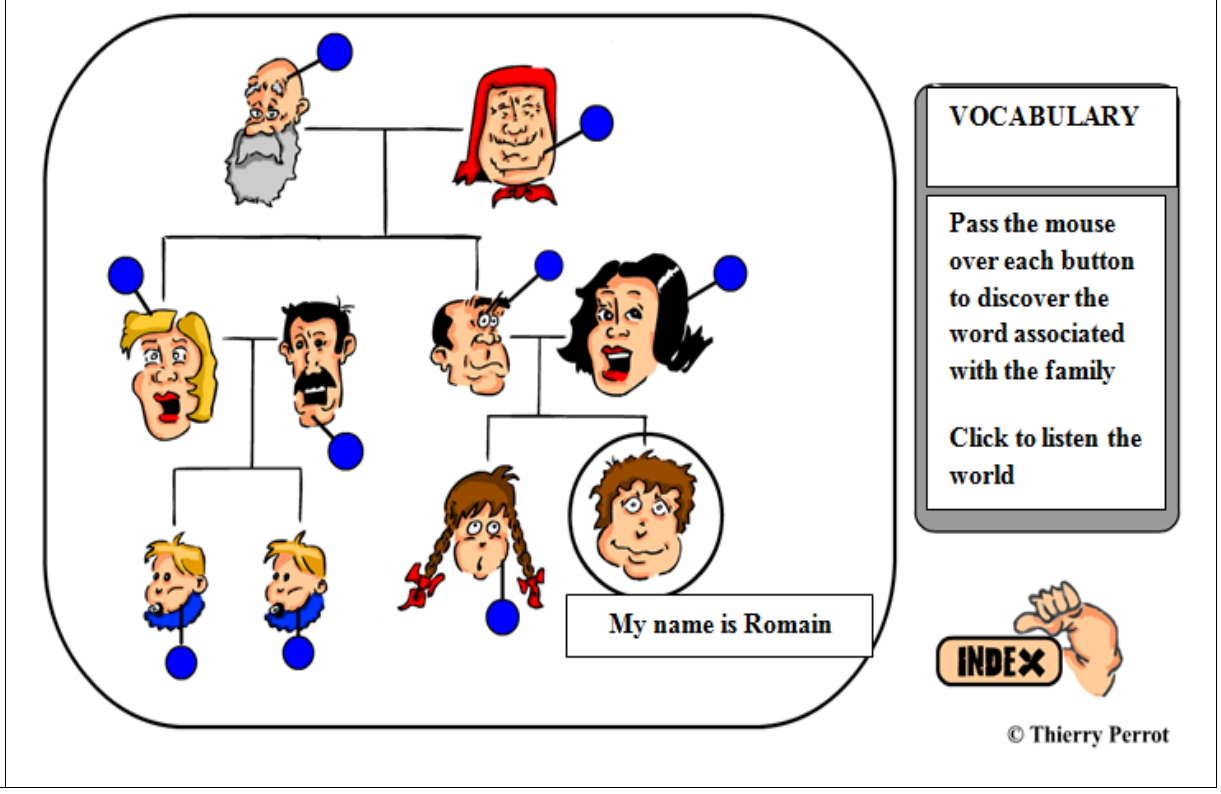
2.3. Application

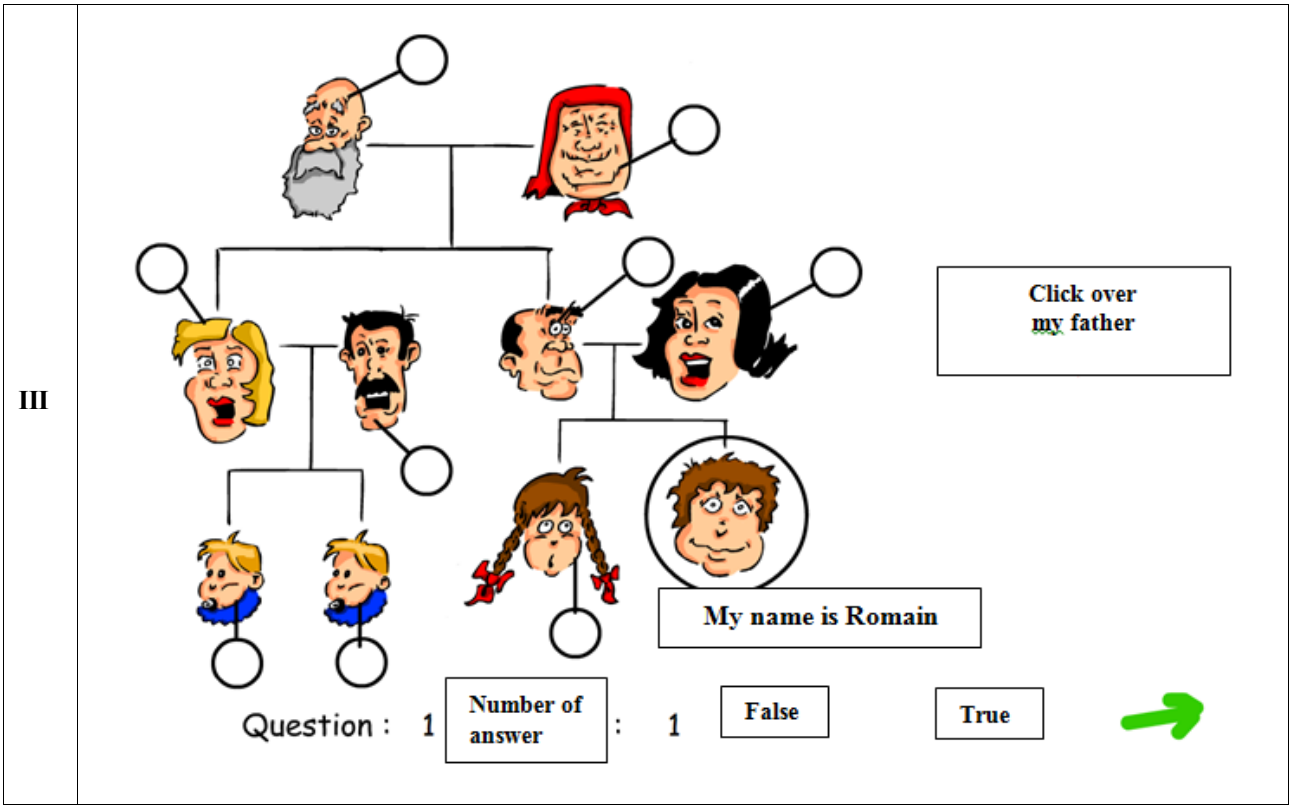
There are several Internet sites devoted to studying French vocabulary in the FFL classroom. For example, when the

teacher or the learner clicks on https://www.lexiquefle.free.fr, he/she can click buttons to discover French vocabulary in different subjects, such as the body, the family, numbers, animals, the train station, in the city, and my home.

This research is based on the usage of the family option on this Internet site. As seen below, when the teacher or the learner clicks the family button, he/she can register this vocabulary program on his/her computer.

Table 1. Internet site regarding vocabulary related to the family

I	
II	



Reference: [63]

As seen in Table 1 below, this method of vocabulary learning is separated into three sections [60]:

(i) In the first part, students can learn 3 different vocabulary words with three various pictures;
(ii) In the second section, students can click on the image of each person of the family to learn the words for the members of family in French; and
(iii) In the third part, students can reply to each question about the members of the family. Finally, they discover if their answers are correct or not.

2.4. Semi-prepared Interview Form

A semi-prepared interview form is composed of 3 questions. 10 learners participated in the interview. The first question prompted them to report on their new knowledge of French vocabulary. The second question sought to gather the positive effects of this research. The third question sought to gather the negative consequences of this application in FFL classes.

3. Findings

The findings of vocabulary test and semi-prepared interview form are demonstrated step by step in this section.

3.1. Results of Vocabulary Test

The results of the vocabulary test are demonstrated in Table 2.

Table 2. Results of vocabulary test

Vocabulary test	Scores	N	%
1st question	0-5 pts.	0	0
	6-10 pts.	100	100
2nd question	0-15 pts.	0	0
	16-30 pts.	100	100
3rd question	0-29 pts.	0	0
	30-60 pts.	100	100
The whole vocabulary test	0-49 pts.	0	0
	50-84 pts.	5	5
	85-100 pts.	95	95

As described in Table 1, the students scored a total of 6-10 points in the first question. Furthermore, they could obtain a total of 30 points on the second question. In addition, they could earn a total of 60 points on the third question. According to the results of this vocabulary test, the scores of 3rd grade students justified that all scored 0-49 points, only 5 learners obtained 51-84 points, and the majority of the students (95 learners) had 85-100 points.

3.2. Semi-prepared Interview Form

The consequences of the semi-prepared interview form are explained in Table 3.

Table 3. Consequences of semi-prepared interview form

	Questions of semi-prepared interview form	Answers of semi-prepared interview form	N	%
1	Explain in detail your knowledge of this application	I learned new French vocabulary words about family members. I formed correct sentences in French.	10 10	50 50
2	What are the positive results of this study?	This study develops our lexical knowledge of French vocabulary. This study improves our linguistics knowledge of French.	12 15	60 75
3	What are the negative consequences of this research?	This research had no negative aspects.	20	100

As seen in Table 2, on the first question, half of the students responded that they learned new words about family members in French vocabulary. Furthermore, half of the learners indicated that they had structured nearly correct phrases in French. In addition, in response to the second question, 12 learners approved that this research allows them to develop their vocabulary knowledge in French. On the other hand, 15 students indicated that this study permitted them to obtain new correct linguistic knowledge in French. Finally, they believed that this application had no negative effects.

4. Conclusions

In consequence, this research is composed of two parts: quantitative and qualitative data as in the other mixed studies. The results of the vocabulary test, formed by the vocabulary test (quantitative method), verified that nearly all students (95 learners) earned good scores (85-100 points). The scores, structured by the semi-prepared interview form (qualitative method), justified that everybody had good opinions about this application.

4.1. Discussions

This study consisted of a vocabulary test (quantitative test) and a semi-prepared interview (qualitative method) form. According to the results of this vocabulary test, nearly everybody scored high points (85-100 points). The responses during the interview indicated that the university students learned new words and constructed correct sentences in French. Also, the learners approved that this research had no negative effects.

Similarly, firstly, [55] and [51] justified that the students learned easily and effectively the words and synonyms in foreign languages through phonetic association and through Data Driven Learning (DDL). In addition, [52], [48] and [49] justified that the learners gained autonomy and spoke efficiently in EFL and also in FFL classes. Finally, [38], [49], [41], [20] and [64] verified that the students improved their knowledge and obtained academic success in both EFL and FFL classes through web-based applications.

4.2. Recommendations

The recommendations for future research are enumerated below:

(i) This research should explore students in various countries of the world;
(ii) This study should be applied during the primary and secondary educational stages;
(iii) Such research should be conducted in EFL, in FFL, and in other foreign language classes; and
(iv) It should be applied at A2, B1, B2, and C1 language levels.

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High Quality Differentiated Instruction – A Checklist for Teacher Professional Development on Handling Differences in the General Education Classroom

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Abstract This paper presents a checklist that scaffolds teachers' professional decision-making with regard to differentiated instruction. It discusses the way the concept of differentiated instruction may be applied in an evidence-informed way by presenting a checklist for high-quality differentiated instruction (DI). We tried to tackle the question of how to implement differentiated instruction in a research-informed way. We sought answers in meta-analyses on effective teaching practices. To investigate accordance between this literature and two models for DI, all elements in these models were operationalized. We scrutinized whether the operational elements in these models are characterized by effectivity as effective teaching practices. The result is an evidence-informed checklist that helps teachers who want to apply the concept of DI in their practice which consists of three sets of criteria: (1) the teachers in relation to the students; (2) the teacher and the learning goals; (3) the teacher and the lesson design. The checklist clearly indicates that DI requires a repertoire of teaching methods. Most elements mentioned in both models for DI are supported by evidence-based research, however the application of flexible grouping and the use of learning styles for DI are discussed. This checklist may aid teachers to assess and improve their own teaching practice.

Keywords Differentiated Instruction, Checklist, Teacher Professional Development, Evidence-informed Education

1. Introduction

As diversity in many European countries increases, the need for educational innovation increases concurrently. Diversity in schools is not only a cultural diversity that has roots in historical and recent migrations it also may be presented as a pedagogical diversity in terms of differences in readiness level, interests or learning profiles. Diversity challenges teachers to take the micro-perspective of students as a starting point from which any educational process must take off. Designing education that takes into account diversity is now one of the priorities of educational policymakers [1, 2]. Teachers are supposed to provide educational opportunities for a variety of different learners in their classrooms. In Flanders, where this study was held, this is supposed to be an elementary teacher competence [3].

Reality is often different. Many teachers regard the ambition to provide inclusive teaching opportunities for a variety of students as a difficult task. Many teachers don't know how to adapt their teaching habits to the new demographic reality or see this challenge as hard to address [4]. They often feel a lack of support and find it sometimes hard to imagine how a differentiated classroom could work [5, 6].

Different approaches are proposed to handle differences in the classroom and thus to provide inclusive educational opportunities for a wide variety of learners. Tomlinson [7, 8] proposed the concept of differentiated instruction as a framework that includes a variety of teaching strategies and methods aiming at maximizing learning profit for all learners in a classroom. An essential feature of the framework is that instructional design is not only related to learning goals such as targeted in the curriculum, but also based upon students' characteristics. Coubergs et al. [9] describe this 'ethical compass' as one of the theoretical foundations of teachers' perceptions about differentiated instruction. Another essential element is that teachers invest in ongoing assessment in order to be able to tailor instructional design to students' characteristics. The model of Hall (figure 1) provides a visual representation of these essential features of differentiated teaching.

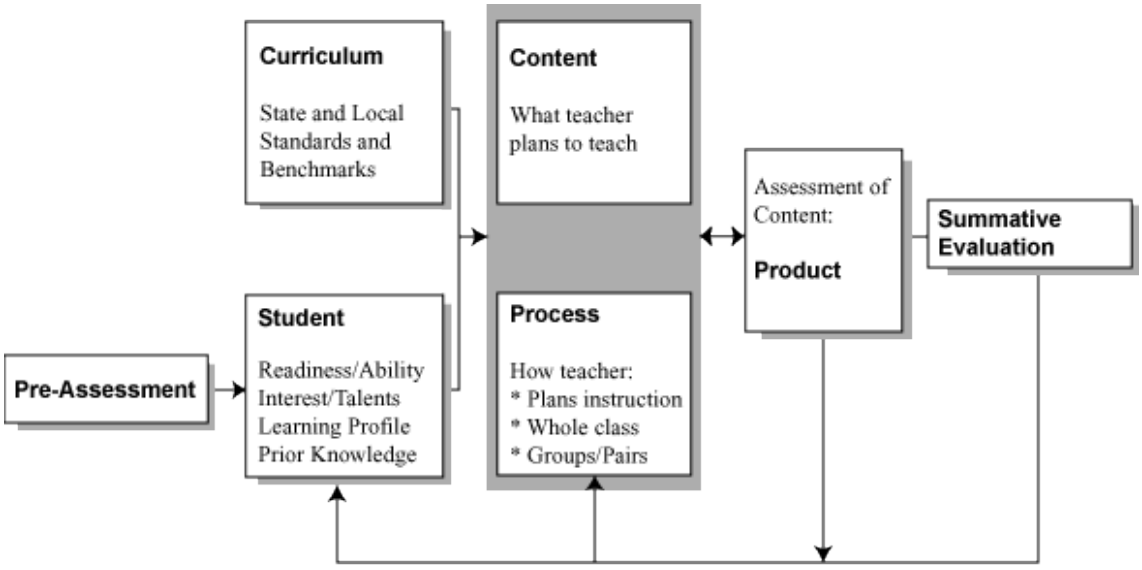

Figure 1. The cyclical process of differentiated instruction [10], adapted from Oaksford and Jones [11]

The comprehensive character of differentiated instruction makes it sensitive to critique as it is difficult to state whether DI is an effective classroom practice. Research on effectivity of DI is scarce and focuses on elements of the construct rather than on the construct as a whole (Firmender, Reis, & Sweeny, 2013; Riviou & Kouroupetroglou, 2014; Smit & Humpert, 2012). The concept of differentiated instruction has until now not been going through academic effectivity research. This is probably due to the difficulty of developing a research design that is suitable for analyzing such a broad teaching concept.

Our ambition is to do full right to the complexity of the subject without staying blind for the need of practice-oriented research findings. The aim of this study is to bridge the gap between academic research on teaching effectivity and practice-based research on differentiated instruction, by providing an instrument that scaffolds teachers' decision-making. Through a systematic comparative approach an evidence-informed [12] checklist is introduced which may support teachers when they are innovation their teaching habits.

2. Method

Checklist-methodology was chosen based on Scriven's recommendations for research dissemination [13]. The checklist that is proposed in this study is based upon a systematic comparison of academic and practice-oriented research. Checklist methodology is broadly used with regard to quality control in highly complex environments. In this study Shufflebaums guidelines for developing checklists are used for this purpose [14]. The following descriptions intend to clarify the process of development of the checklist, and to explicit the most important choices that were made.

2.1. Sample and Scope

Important practice-oriented research on differentiated instruction has been conducted by researchers of the ASCD. The most well-known expert in the field is Tomlinson who has published extensively on the topic [7, 8, 15]. In Belgium, where this study was conducted, the largest research expertise on the matter is centered at the university of Brussels were Struyven and Coubergs have built up substantial experience [16-18]. The research for the 'checklist high quality differentiated instruction' started from two models for differentiated instruction that were developed by each of these experts [8, 16]. The goal of this study is to systematically verify to which extent the suggested teaching strategies that are proposed by these experts are reflected in meta-analytical literature on teaching effectivity. Three comprehensive sources of educational effectivity literature were chosen as a source to make these verifications. Operational characteristics such as described in 2.2 were systematically compared with assertions in these three reference-works in general teaching effectivity. The selected works are to be seen as expert-references in the field [19-21] of educational effectivity. The choice to work with these generalist summaries for effective teaching is argued on the fact that many teachers in practice use these works as a reference.

2.2. Operational Characteristics of Differentiated Instruction

Both models of differentiated instruction were analyzed and summarized into a set of eight operational characteristics. The characteristic of the model of Coubergs, Struyven [16] is a translation of the author of the original Dutch version.

Table 1. Set of operational characteristics of differentiated instruction.

Tomlinson	Coubergs & Struyven	Operational characteristics	
Teacher's response to learner's needs	Handling differences	Teacher reacts to different student characteristics depending on student's needs.	A
Adapting to students readiness, interests, learning profile	Interest, learning profile, learning status: aiming at maximizing learning	Teacher adapts to differences in learning status, interest and/or learning profile aiming at maximizing learning.	B
Respectful tasks		Teacher adopts respectful attitude towards students.	C
	Teacher philosophy: growth mindset & ethical compass towards student	Teacher acts following principles of growth mindset Teacher's ethical compass is directed towards students	D
	Positive, proactive, planned	Teachers handles differences in a positive, proactive and planned way	E
Differentiation of content, process or product		Teacher makes adaptations to content, process and product	F
Flexible grouping	Flexible grouping	Teacher uses flexible grouping	G
Ongoing assessment and adjustment	Input = output	Teacher gathers continuously information Teacher adapts lessons based on this information	H
Range of instructional and management strategies		Teacher uses a range of instructional methods and organizational strategies.	I

2.3. High Quality Teaching

This study is grounded in a perspective on teaching that is grounded in complexity science. 'Teaching is not a matter of applying a method or using a strategy; it is a matter of human interactions, within a complex network of interpretations and relationships' [22]. Given the complex nature of the learning sciences [23] teachers' are continuously challenged to interpret the plethora of recommendations that are provided by the educational sciences. A crucial determinant of promoting high quality teaching is enabling teachers' professional learning [24]. Therefore we believe it is vital to support their professional decision-making, by making research evidence more accessible. We agree with Biesta [25] that the complexity of the educational sciences cannot be reduced to simple 'what works' questions. Rather high quality teaching may be determined by evidence-informed teachers [12, 26] who reflect on their actions in order to foster and improve the quality of their own teaching practice. In order to facilitate this evidence-informed practice the checklist that is proposed in this study intends to present a large body of evidence related to differentiated teaching in an accessible way. Hence, suggestions are made for how to use the checklist for high quality differentiated instruction in the 'implications' section.

2.4. Thematic Clustering

Assuming that these meta-analyses provide a relevant overview of educational research, they were used as a reference to scrutinize the operational characteristics proposed in 2.2. A thematic analysis [27] was made of the elements in these studies that relate to the operational characteristics mentioned in table 1. After initial coding, the results of the thematic analysis were clustered in the main themes that refer to three essential features of differentiated instruction which are also described in the introduction: (1) differentiated instruction adapts instructional design to students' needs; (2) differentiated instruction is not only based on curriculum goals, but also on student characteristics; (3) differentiated instruction is aimed at maximizing learning outcomes. It was a deliberate choice to present the first characteristic of adapting instructional design only as a third theme, because we believe both other themes are to be handled prior to instructional adaptations.

The first theme is grounded in the idea that teachers do not only base instructional design on curriculum targets, but that students characteristics are equally determinants for instructional design. As a result of this it is essential that the teacher relates to his or her students. This theme clusters a series of less tangible recommendations that nevertheless are vital for successful differentiated instruction. A second cluster refers to curriculum standards and other learning goals. In order to be able to provide tailored instruction, teachers appear to be very well aware of how to address the targeted learning goals. Clearly this theme relates to the idea of maximizing learning outcomes. Important is that ongoing assessment is used to provide both students themselves and teachers with feedback of what has been learnt and feed-forward of what is to be learnt. The third theme is the most evident one, as it addresses questions on instructional design and classroom management. Evidently the wide variety of teaching strategies that are used for differentiated instruction could not be integrated in the checklist. However, it was chosen to cluster them in more generalist checklist items that summarize the main elements.

3. Results

The comparison of practice-oriented expertise of Tomlinson on the one hand, and Coubergs and Struyven on

the other hand with international literature on teaching effectivity resulted in three sets of characteristics of high quality differentiated instruction. These characteristics are more specified than the operational elements we found in the models of Tomlinson and Coubergs & Struyven. In this section each of the sets is shortly explained.

3.1. The Teacher and his/her Students

The teacher stands in close relation with his/her students. Opportunities to discuss with students about their learning are offered. This implies that the teacher cannot be continuously talking and that questions are equally distributed between the teacher and the students. By considering social relationships between students the teacher creates a safe climate where learning is possible for anyone. In this climate failure is possible and even encouraged as it proves that a student is giving effort to leave the proper zone of comfort. The teacher gathers assessment data in order to integrate them in the student's learning process. The teacher does not let himself be guided by labels, but uses information on the student as a start of a learning process. Fundamental is a growth mindset towards students' learning possibilities. By setting high, but not necessarily equal, expectations the teacher helps them to set high expectations for themselves.

Table 2. criteria "The teacher in relation to his/her students"

The teacher…	
□	Shows interest for the students and relates to them with regard to their learning
□	Installs a classroom culture where failure is possible
□	Has high expectations for all students and help them surpass themselves
□	Has a well-balanced view on students with knowledge of personal characteristics and without one-dimensional stereotyping
□	Considers learning attitude and habits of students, and helps improving these

3.2. The Teacher and the Learning Goals

The teacher is well aware of the goals he/she pursuits. He/she understands the levels of and interconnectedness between learning goals and has insight in how learning goals can be attained trough different learning paths. In structuring learning goals to complexity the teacher creates challenges that fit with students' personal readiness level. By clearly stating the desired level of competence at the end of the learning process, and by formulating intermediary goals the teacher specifies for students what is expected. During the learning process the teacher provides ongoing formative assessment in order to give students insight was has and what has not been learned yet. This formative assessment provides students with insight in the proper learning path, and creates for the teacher the opportunity to adapt his/her lessons to it. The assessment data are thus not only an assessment of learning but also an assessment for learning.

Table 3. Criteria "The teacher and the learning goals"

The teacher…	
□	Understands learning goals and know how to structure them towards complexity
□	Provides students with insight in the learning path to follow
□	Provides students with feedback of what has been learned, and feed-up for what still needs to be learned
□	Gathers assessment data on what has been learned, and uses this in the future teaching design.

3.3. The Teacher and the Lesson Design

At the start of a learning process a teacher always builds on what students already know and can. Study materials are thus never entirely new. Thanks to a rich set of teaching strategies the teacher is capable of meeting students' diverging educational needs. The choice of teaching strategies is always based upon maximizing learning outcome for all students in the class. Hence they are always adapted to where students are in the learning process. By adapting to students' interests, learning profiles and readiness levels the teachers makes sure that anyone's learning process is enriched, where necessary or useful temporary homogeneous or heterogeneous collaborative learning groups are created to provide tailor-made instruction or learning materials.

Table 4. Criteria "The teacher and the lesson design"

The teacher…	
□	Builds on existing knowledge, skills and attitudes
□	Uses a diversity of different teaching strategies
□	Adapts the teaching strategy depending on where students are in the learning process
□	Uses flexible grouping depending on students interest, learning profile and learning status

4. Discussion

4.1. High Quality Differentiated Instruction

Teachers that implement differentiated instruction in their classroom may use the models that were used in this study. Almost all of the elements in these models are explicitly mentioned by authors of international effectivity research as elements of good or effective teaching. It may be concluded that the framework of differentiated instruction as proposed by Tomlinson and may be regarded as good teaching practice. As such the operationalization of the used models for differentiated instruction can be a helpful guidance for teachers that want to address differences in the classroom. It helps bridging the gap between research and practice in the educational field [28]. Notwithstanding this, it may be clear that teaching is a complex activity, and that it is dangerous to simplify recommendations for high quality teaching. We are therefore convinced that high quality teaching is not only dependent on the quality of the strategies used, but above all

dependent on the reflexive attitude of the teachers that implements the strategies. By acting reflectively [29] teachers may connect the challenges of everyday reality with the recommendations of scholarly educational sciences. The checklist we propose in this study may serve as a scaffold for this purpose.

The operational elements under scrutiny in this study resulted in a selection of checklist-criteria for high quality differentiated instruction. Some of them show important overlap with good teaching in general. In particular the elements of the first set of criteria that concern the relationship of the teacher with his or her students. Two elements deserve more specific comment as research is not entirely clear on how to bring them into practice. These elements are the aspect of flexible grouping and the aspect of considering learning styles.

4.2. Flexible Grouping

Experts on differentiated instruction promote the use of flexible grouping techniques. These techniques are in particular relevant with all kinds of cooperative learning activities. Flexible grouping permits teachers to accept different interests and different readiness levels in the same classroom as an opportunity rather than as a problem. Flexible grouping may also encompass using temporary homogeneous grouping. Research however is often negative on the possibility of homogeneous grouping. Both Hattie [19] and Muijs and Reynolds [21] are arguing against it.

It remains doubtful whether the contexts in which research warning against homogeneous grouping is an appropriate way to make statements on homogeneous grouping in differentiated instruction. It seems for instance not sure whether homogeneous grouping based on interests is really problematic. Still it emerges that homogeneous grouping based on readiness levels may be problematic as a result of decreasing students' self-efficacy and teachers' expectations, particularly if this kind of grouping is often practiced. These effects are important effects to consider for teachers that want to implement differentiated instruction.

4.3. Learning Styles

Much discussion has been made over de last few years on the matter of learning styles. This discussion must not be overdone here. However it is clear that the topic has been labeled problematic by many theorists, and that still a lot of practitioners see a substantial added value of different theories on learning styles.

With regard to differentiated instruction the question must here be whether teaching time sacrificed to framing a student's learning style is really spent effectively. Given the problematic character of learning styles we think it would not be advisable to lose much time on this topic. However some of the learning style models may help students to enhance their self-knowledge and could in this way provide some added value.

Another question is whether it makes sense to base students' assignments on a prior analysis of his or her learning style. Given the problematic character this topic the answer would be easily negative. Moreover, based on principles of self-determination it may be argued that students in a differentiated classroom should be provided with a maximum of choice to stimulate students autonomy, and therefore also motivation. If this integration of choice would encompass differences in learning styles where students are allowed to make choices depending on their own preferences probably no harm would be done.

5. Implications for Teacher Education

The introduction of differentiated instruction is often a long and difficult process that requires a lot of time [5, 30]. As a consequence it is not easy to prepare teachers for this difficult task. Intense professional development is needed for beginning teachers aiming at professional development to enable teachers to respond to differences in the classroom [31]. Also more experienced teachers do not always feel well prepared to engage in differentiated instruction [32]. As a result of that, teachers ask for support when they start introducing differentiated instruction [5]. Both in-service and pre-service teacher education is by consequence challenged to adapt its curriculum in order to prepare its students adequately for dealing with diversity in the classroom, and in particular for implementing differentiated instruction in their practice. We believe scaffolding is needed to support teachers' professional development. The checklist that is presented in this study may serve such a scaffolding purpose in order to foster the introduction of differentiated instruction.

The aim of the checklist that is presented in this article is to support pre-service and in-service teachers' evidence-informed decision-making when responding to student heterogeneity in the classroom. It may serve as a document for personal or collective reflections of teams of in-service teachers and teacher students. We illustrate this with three examples:

(1) As a response to increased heterogeneity a school chose for setting groups of students for mathematics. 4 hours per week students are grouped in homogeneous ability-groups across classes. Mathematics teachers adapt their instruction based on the ability group they are teaching to. One of the teachers however doubts whether this is a good idea. He thinks students in the low-ability group are being stigmatized as 'low performers', and he therefore wants to discuss the school's setting policy. On the monthly staff meeting this teacher uses the checklist to discuss his opinion with his colleagues: he believes the idea of setting ability-groups does not align with the idea of 'flexible grouping' in the

checklist. He also point to the risk of low teacher- and student expectations in the low-ability group for which the checklist warns.

(2) A teacher is used to work with Kolb's learning styles theory [33]. In the beginning of the year students of her are usually asked to fill out a questionnaire, and to reflect on their own preferred learning style. The teacher uses the survey-information to enable students to make a choice further on in the year. Based on the criteria "The teacher in relation to his/her students", she starts doubting whether this approach is a good idea. If feels as if this learning styles approach is a fairly one-dimensional approach. Based on this insight the teacher broadens her approach; focus lies now not on learning styles, but rather on other types of metacognitive skills by proposing the students a reflective assignment based on self-determination theory. The idea that teachers help improve students attitudes on learning (second set of criteria) is a support for to the teacher to keep on spending time to this important topic.

(3) A team of teachers intends to apply a strategy in which student get assignments tailored on their prior knowledge. However, the teachers realize that they lack the necessary assessment data in order to be able to do so. Using the checklist they realize they have underestimated the importance of the first two sets of criteria of the checklist. The conclude that in order to be able to provide high quality differentiated instruction, they need to relate stronger with their students in order to find out about their interests and prior knowledge. Moreover they decide to install formative assessments in order to gather more objective data on students' learning progress.

Given the complexity that has been described [34] of the learning sciences, we believe that no simple conclusions can be drawn with regard to teaching in a differentiated classroom. We agree with Cochran-Smith, et al. [35] that when 'what-works-questions' or 'what's best-questions' yield one-dimensional answers, they always result in a significant reduction of the complex reality. Therefore we believe administration of the checklist may not be reduced to a 'to-do-list'. Items of the checklist are no fixed do's or don't. On the contrary, they are guidelines that intend to stimulate reflective practitioners to assess their work. Moreover, this checklist for high quality differentiated instruction may serve as a scaffold for teachers who want to increase the quality of their teaching. When discussing the strategies they use or intend to practice, teachers may use the checklist as a point of orientation to build their reflective practice on [12].

6. Conclusions

Differentiated instruction is a construct that enables teachers to integrate differences amongst the students in their classroom into everyday teaching practice. This is why a checklist was developed for teachers to foster teachers' evidence-informed decision-making with regard to differentiated instruction with three set of categories: 'the teacher in relation to his/her students', 'the teacher and the learning goals', 'the teacher and the lesson design'. Most of the experts' recommendations are grounded in research on teaching effectivity. The implementation of differentiated instruction needs careful consideration as some concepts may be problematic. In particular the use of homogeneous ability grouping may be sometimes counterintuitive. The use of learning styles is even more problematic. All other operational elements in the models under scrutiny in this study may add to teachers' evidence-informed decision-making.

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Changing Paradigms: From Schooling to Schools as Adaptive Recommendation Systems

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Abstract The paper explores a shift in education from educational systems requiring student adaptation to educational recommendation systems adapting to students' individual needs. The paper discusses the concept of adaptation as addressed in educational research and draws on the system theory of Heinz von Foerster to shed light on how the educational system has used and understood adaptation. In this context, we point out two different approaches to educational adaptation: 1) students adapting to the educational system and 2) the attempt of the educational system to adapt to students through automatized system adaptation and recommendation systems. These different understandings constitute a design framework that is used to analyze two current trends: Adaptive learning systems and learning analytics. Finally, the paper discusses the potential of looking at adaptation as recommendation systems by presenting a case, which is methodologically inspired by Design-Based Research, in the form of a special type of adaptive MOOC, the so-called adaptive SPOC (Small Private Online Course).

Keywords Adaptation, Adaptive Learning Systems, MOOC, SPOC, DBR, Educational Design Research, Learning Analytics, Cybernetics, Non-trivial Machines

1. Introduction

Adaptation is not a new phenomenon in education; good teachers have always adapted to their students' individual needs by, for instance, modifying the way content is presented, the academic level, the sequencing of assignments or tasks, and the nature of the guidance and feedback provided. However, with the advancement of what Siemens et al. [1] refer to as fifth-generation educational technologies, adaptive learning has reached a new momentum within the field of educational research, and teachers and students are facing new opportunities and challenges as adaptive learning systems are implemented throughout the educational sphere. In this paper, we will explore two fundamentally different approaches to educational adaptation, but to understand the challenges that we are currently facing, we must first look at the historical and social context of the concept.

Adaptation can be broadly defined as "the capability exhibited by an organic or an artificial organism to alter its behavior according to the environment" [2]. The concept of adaptation has been discussed within the field of evolutionary science for centuries, and two opposing approaches have gained ground. According to Charles Darwin and Herbert Spencer, the survival of the fittest depends on the ability of the individual to adapt to its environment; those who have the greatest adjustive capacity, are those who succeed [3, 4]. Following this line of argument, institutions have come to serve as instruments of natural selection by demanding adaptation from those entering the system. In this tradition, adaptation within an educational context becomes a deterministic means to anticipate natural selection; by predicting who will be able to succeed within the existing structures of the educational system, failure can be reduced and challenges, which might under other circumstances have forced the system to change, are eliminated [5].

Experimental scientists, on the other hand, explain evolution along the lines of James and Dewey, arguing that a human being's chances of success rely on his intelligence; humans must change the environment to their needs rather than simply accepting the environing world as it is. In this tradition, humans are seen as essentially independent and creative, and attempts to predict a person's behavior are regarded as pointless [5]. In an educational context, this approach is consequently concerned with finding the one best way to reach the highest average in terms of student performance.

This leaves us with two antagonistic approaches; one which accepts the institution and seeks out those who fit into its existing structures, and one which challenges any institution that does not comply with a generalized idea of the intelligent human being. According to Cronbach, however, both approaches result in limited social benefit,

because they deal with adaptation on a merely abstract level without acknowledging that adaptation is always context-specific. Discussing adaptation in relation to applied psychology, Cronbach argues that "if for each environment there is a best organism, for every organism there is a best environment" [5] and for this reason, the goal of applied psychology should be to "find for each individual the treatment to which he can most easily adapt". In line with this, we will put forward the argument that in education, adaptation should be about shaping for each student the best learning environment by recommending a unique learning path that takes into consideration the individual needs of the student.

Ideally, a technology enhanced, adaptive learning system does what the expert teacher does, but in addition to this, it allows for scaling and hence improves the effectiveness and efficiency of educational adaptation. The ultimate goal of an adaptive learning system is to personalize teaching and learning in order to accelerate the student's learning outcome. This goal can be obtained if the adaptive learning system is able to identify what a student does not know or is unable to do, identify and recommend content that will allow the student to learn it, and assess the student's performance until s/he has achieved a specific learning outcome. At a practical level, adaptive learning systems thus address a number of challenges that have always dogged educators: Students in the same class have different academic levels and bring with them different types of knowledge and skills; the content provided is either too easy or too difficult, which tends to frustrate students; and finally, teachers find it hard to adapt to students' individual needs because one-to-one instruction remains a utopian dream due to the harsh economic realities of most educational institutions [6].

Even though adaptive learning systems share the same overall goals of improving the student's individual learning outcome, such systems can take many different forms once implemented. In this paper, we will discuss two fundamentally different approaches to adaptation in education: The first approach is based on the underlying assumption that the student must adapt to the educational system, whereas the second approach requires the educational system to adapt to the student. To illustrate the latter approach, we will discuss two different kinds of adaptation modes in which the system adapts to the student, namely automatized system adaptation and recommendation systems. Finally, we will turn our attention to the potentials of adaptive recommendation systems by presenting a case in the form of an adaptive SPOC (Small Private Online Course). A SPOC is a crossing between a MOOC (Massive Open Online Course) and an online course that is small rather than massive and private rather than open [7].

2. A Brief History of MOOCs

The concept of MOOCs is a relatively new phenomenon in the history of distance learning. In 2013, *The Horizon Report* identified the development of MOOCs as "the most important trend in education" [8]. MOOCs are new forms of distance learning, and we are yet to find out whether they are "expanded forms of online higher education", as proposed by Evans & Myrick [9], or the newest fad in online distance learning that will soon be written off in favor of the next educational quick fix. The MOOC concept originated in 2008 when the first MOOC was introduced, and various MOOC designs have since then evolved from two fundamentally different types of MOOCs: The so-called cMOOC and the xMOOC. The latter is influenced by traditional e-learning courses in distance learning, while the first was born from the theory of connectivism [10] and emphasizes collaboration and the production of text, video or artefacts in addition to bringing learners together. In 2012, Siemens stated that the difference between the two types of MOOCs is that a 'cMOOC model emphasizes creation, creativity, autonomy and social networking learning" and focuses "on knowledge creation and generation", whereas the xMOOC model emphasizes "a more traditional learning approach through video presentations and short quizzes and testing and focuses on knowledge duplication" [11].

In the last five to six years, however, MOOC designs have drawn inspiration from both approaches, and more "blended" formats have appeared that combine elements from both camps: "What we are starting to see now, is a move away from the cMOOC/xMOOC binary toward recognition of the multiplicity of MOOC designs, purposes, topics and teaching styles" [12]. The MOOC milieu, from which our SPOC derives, is a blended MOOC that draws on principles from both the cMOOC and xMOOC models as well as other models. The emergence of blended formats highlights the need for a more balanced understanding of how MOOC designers subscribe to various ideas of learning, teaching, participation, content production and collaboration.

3. Design Framework and Classification of the Concept of Adaption

This section aims at discussing different understandings of the concept of adaptation within the educational system. We identify two fundamentally different approaches to educational adaptation: 1) *students adapting to the educational system* and 2) *the attempt of the educational system to adapt to the students*. Furthermore, we divide the latter into two kinds of adaptation modes: 2a) *automatized system adaptation* and 2b) *recommendation systems*. We then move on to discuss two examples of current trends; *adaptive learning systems* and *learning analytics*. But first we begin our journey in second-order cybernetics using the machine as a metaphor for understanding the relationship between the educational system and the students.

The Austrian physicist and founding father of second-order cybernetics and early constructivist learning

theory, Heinz von Foerster, has, inspired by the work of Alan Turing, proposed the machine as a metaphor. His distinction between trivial and non-trivial machines, which originally set out to say something about cognitive behavior, can, as von Foerster later did himself, be used to criticize the educational system and the concept of adaptation. Some researchers, among them von Foerster himself, have argued that the distinction between trivial and non-trivial has proved to be an "ideales Instrument und Argument für das Aufzeigen eines Paradigmenwechsels für die Schule" [13]. Von Foerster labelled the school and the educational system "Eine Anstalt zur Trivialisierung von Menchen", i.e. a factory with the aim of making people trivial, referring to the pupil-teacher relationship as a trivial relationship or a trivial-machine: If you insert a certain input you will get an output that is known and recognized by the system beforehand. In relation to this, von Foerster criticizes rote learning and the overall focus on Memorization in schools. The processes taking place are analytically determinable and therefore predictable. Graphically von Foerster has presented the trivial-machine in the following way:

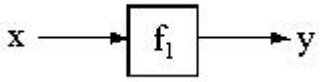

Figure 1. The trivial-machine [14]

The x in Fig. 1 specifies a certain input, which might, for example, be a question posed by a teacher to a pupil (f1). The output y is the response from the pupil to the specific question or input, which is known beforehand by the system/teacher.

The basic problem is, says von Foerster, that people are not trivial-machines. You cannot assume a certain output based on a specific input. For this reason, he proposes the concept of a non-trivial-machine: You can insert a certain input, but the output is never known beforehand. The non-trivial machine is analytically un-determinable and unpredictable. The non-trivial machine can be illustrated as follows where the S indicates a stimulus, which Von Foerster labels "an internal logic where the operator changes with every operation:

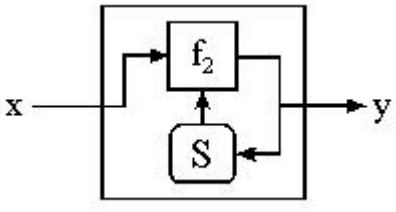

Figure 2. The Non-trivial machine [14]

How is this basic discussion related to the concept of adaptation? We propose that the metaphors proposed by von Foerster can be used to unmask a certain understanding of adaptation in educational design, namely automatized system adaptation, which is often put forward as learner (and teacher) empowerment, because educational designs using automatized system adaptation change according to student behavior. We use the term *unmask* because this is done on the premises of the system itself, not the learners, and in terms of von Foerster's metaphor, automatized system adaptation is a trivial position.

In a traditional educational context, students have always been forced to adapt to the system/school; students are obliged to learn to behave in a certain way, they have to show up on specific dates and at specific times, and they have to learn a specific language [15, 16]. The underlying assumption is that if you put in a pupil, i.e. an input, you will get a certain output, i.e. a specially designed student who has learned to adapt to the system. This is masterfully portrayed in Pink Floyd's "Another Brick in the Wall Part 2" with the famous children's chorus: "We don't need no education, we don't need no thought control", but in schools, as Philip W. Jackson concluded in 1968, "all is lost, when group control is lost" [16]. This position has met substantial critique for not teaching for human beings but teaching for the system. Situated learning [17], student-based teaching [18] and teaching and learning for essential competencies such as the 21st Century Learning Skills [19] are among the many strategies to fight the critique of the educational system: "Too often the practices of contemporary schooling deny students the chance to engage the relevant domain culture, because that culture is not in evidence. Although students are shown the tools of many academic cultures in the course of a school career, the pervasive cultures that they observe, in which they participate, and which some enter quite effectively, are the cultures of school life itself"' [20]. To succeed within the educational system, students must master the cultures of school life. One of the earliest studies of schooling and the educational system is found in Philip W. Jackson's "Life in Classrooms", which was first published in 1968 and has become a landmark in educational research. His studies contribute to an analytic view about the lives of young people in special rooms in special buildings where "classrooms, by and large, are relatively quiet places and it is part of the teacher's job to keep them that way" [16]. Jackson presents the concept of *classroom etiquette* to cover the required behavior for people in these rooms, who have to adapt to this code of conduct in order to survive. His studies show that the educational system is a specific type of system that requires a high degree of adaptation from students in terms of a specific behavior. For instance, the concept of waiting is of high importance in schools, where the students learn that a classroom is" a place where things often happen not because students want them to, but because it is time for them to occur" [16].

Automatized system adaptation and learning in automatic systems are by no means newcomers in schools and education. They have been players in the field for more than 50 years [5, 21], but with the increased investment in digital, educational technology in the past decades, automatized

system adaptation has grown in terms of learning resources, platforms and various forms of educational technology. Automatized system adaptation is, however, not a paradigm shift in education. Rather, it is what we label as camouflage. The concept of automatized system adaptation is still, in the words of von Foerster, a trivial system because the learner is the one who has to adapt to the system. An automatized system may have various ways for students to enter and pass through, for example, a math assignment, but even though the system is automatized, it is nevertheless based on the premises of the system, and the various paths or learning ways are predetermined within the system itself. It is, in other words, the system that sets the standards and the design for the adaptational work to take place in.

Adaptation seen as recommendation systems set out to empower both students and teachers offers another way of looking at the concept of adaptation. This approach can be described as non-trivial adaptation using von Foerster's terms. Recommendation systems are the opposite of mechanical adaptation; here the starting point is the student, the student's competencies and learning history. Every student has a unique profile, different educational learning paths, and if an educational design includes this as a starting point, the crucial idea is that the system must adapt to the learner and not the other way around. In the next section, we will look further into this approach.

4. Three Approaches to Solving the Scaling Problem

In 1984, Benjamin Bloom published the paper "The 2 Sigma Problem", which shows that the instructional design referred to as one-to-one tutoring (one teacher per student) is far more efficient in terms of student learning than group instruction [22]. Bloom concluded that there was a need for research in classroom methods that are as effective as one-to-one tutoring, because this design is "too costly for most societies to bear on a large scale" [22]. Bloom's "2 Sigma Problem" is a *scaling* problem related to the well-known instructional design model, which visualizes one-to-one tutoring:

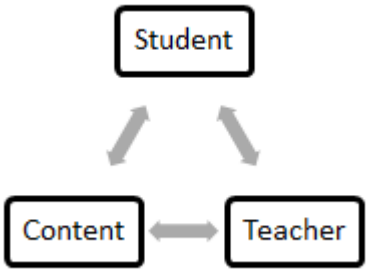

Figure 3. Traditional, instructional design model [23].

The developments of adaptive classroom methods that are able to support differentiation, individualization, and personalization have not been encouraging. In particular, three technology enhanced teaching concepts have been marketed with the promise that they can solve the scaling problem. These concepts try to *transform* the role of the teacher in the above design model.

- The first concept is *adaptive learning systems* that *replace* the teacher with a technical system.
- The second concept seeks to *empower* the teacher with new digital technologies which will enable the teacher to perform adaptive instructional designs that match each student's personalized learning needs. *Learning analytics* is the latest technology trend, which aims to support teachers in this teaching task.
- The third concept is the adaptive MOOC (Massive Open Online Courses), which transforms teacher presence into *mediated* asynchronous teacher telepresence.

For all of the three concepts, implementations that are based on the idea of adaptation as either automatized systems or recommendation systems are possible.

4.1. Adaptive Learning Systems

Attempts to individualize instruction with a technical system is an older idea. Frederick Taylor [24] was interested in the idea of a "teaching machine". In 1958, B.F. Skinner introduced the idea of technology mediated programmed learning [25] and in the 70s much research in the field of Computer-Assisted Instruction (CAI) took place. The criticism of this approach, and especially the radical behaviorism developed by Skinner, has been intense in education research for decades. Adaptive learning systems are this century's attempt to develop a "fifth-generation" educational technology [1] adapted to the user's needs.

Most adaptive learning systems consist of three components [6, 26]: A content model, a learner model and an instructional design model, which is a strategy for the adaption process.

A content model structures the content of learning objectives, sequences and tasks to be solved [26]. A content model divides the subject into smaller elements, which can be associated with different types of learning resources [27].

An adaptive learning system also contains a model of the learner [28]. The model is based on one or both of the following categories: a) the learner's current knowledge, and b) the learner's learning preferences. The model of the learner must visualize the personalized curriculum a given person should be offered in a concrete course. Most adaptive learning systems therefore identify the learner's existing knowledge and compare the learner's knowledge with the knowledge structure or curriculum for a given subject.

The majority of all commercial adaptive learning systems also try to model the learner's preference for certain types of learning processes. Attempts to categorize the learners in cognitive types or learning styles are very common. In a review of 70 published articles on adaptive learning systems

[29] 81 % of the participating learning systems used cognitive types or learning styles for modeling learners. Most used were cognitive types based on Kolb [30] and learning styles based on Felder & Silverman [31] or Dunn and Dunn [32]. Despite the widespread use of models of the learner building on typologies of preferences in terms of learning styles or cognitive types, the same study showed that "findings on concrete learning outcomes were not strong enough" [29].

For this reason, it is important to be critical towards adaptive learning systems that emphasize the identification of specific preferences and hypotheses concerning specific learning styles. Especially because the development of a model of the learner based on hypotheses related to the learner's preferences can develop into what is called "stereotype methods" [33].

The third dimension in an adaptive learning system is the strategy of adaptation. Basically, we can distinguish between two adaptation strategies: Recommendation systems or controlled navigation [44]. In a recommendation system, the technology identifies a range of possibilities, which the system priorities for the learner based on a learner model or on the basis of the learner's performance in the system. The learner is, however, free to choose whether to follow the recommendation or not. By controlled navigation, the system hides the links which are not relevant to the learner, either because they do not match the model of the learner or because they do not match the learner's continuous performance in the system.

An important design discussion is the question of who should have control of the adaption process. Is it the system or the learner [1, 33]? Reviews of research on adaptive learning systems show that this is not always reflected in the design of the adaptive learning system [29, 34]. The problem is that the adaption process may be invisible to the learner, since the rules or algorithms that are used to control the system is not known or understood by the user. The system can collect a large amount of data about the user (big data) through the monitoring of the learner's interactions with the system [1]. This raises a number of ethical questions and dilemmas of privacy and users' control of their own data. Who owns the data produced by an adaptive learning system, and what can and should this data be used for?

4.2. Learning Analytics

As we can tell from the above, the solution to solving the scaling problem does not involve replacing the teacher with a technology that performs automatized adaptation on the basis of non-transparent algorithms. In recent years, different types of technologies and a completely different understanding of the teacher's role has gained attention. These concepts shall *empower* the teacher with technologies that will enable the teacher to perform adaptive instructional designs that match each student's personalized learning needs. *Learning analytics* is the latest technology trend that aims to support teachers in this teaching task.

Research in learning analytics has been scarce. The first international conference was held in 2011, where learning analytics was defined "as the measurement, collection, analysis and reporting of data and their contexts, for purposes of understanding and optimizing learning and the environments in which it occurs" [35]. Learning analytics uses methods from data mining but with a different purpose. As opposed to data mining, which aims to automate data collection, pattern recognition and perform automated adaptation, learning analytics aims to collect and analyze data in order to support teachers and students in making more informed choices of adaptation strategy [11, 36]. The differences between the two technologies are summarized by Siemens and Baker [11] in the figure below:

	Learning Analytics	**Educational Data Mining**
Discovery	Leveraging human judgment is the key; automated discovery is a tool to accomplish this goal.	Automated discovery is the key; leveraging human judgment is a tool to accomplish this goal.
Reduction & Holism	Stronger emphasis on understanding systems as wholes, in their full complexity.	Stronger emphasis on reducing to components and analyzing individual components and relationships between them.
Origins	Stronger origins in the semantic web, "intelligent curriculum," outcome prediction and systemic interventions.	Strong origins in educational software and student modelling, with a significant community in predicting course outcomes.
Adaptation & Personalization	Greater focus on informing and empowering instructors and learners.	Greater focus on automated adaptation (e.g. by the computer with no human in the loop).
Techniques & Methods	Social network analysis, sentiment analysis, influence analytics, discourse analysis, learner success prediction, concept analysis, sense-making models.	Classification, clustering, Bayesian modelling, relationship mining, discovery with models, visualization.

Figure 4. A brief comparison of the two fields [11]

As shown in Fig. 4, Siemens and Baker [11] seek to reserve the term *learning analytics* for technologies that we define as adaptive recommendation systems, which serve the purpose of informing teachers and students about pedagogical practice in order to empower both parties. Educational data mining is, on the other hand, used by Siemens and Baker to describe technologies that rely on automatized adaptation. We acknowledge this essential distinction, but are also aware that learning analytics, in the same way as adaptive learning systems becomes an umbrella term for technologies that can take the form of both recommendation systems and automatized adaptation technologies.

4.3. Adaptive MOOCs

The third education concept enhanced by technology that seeks to solve the challenges related to adaptation are adaptive MOOCs. University College Absalon in Denmark has established a research project with the aim of developing a design framework that can guide the development of SPOCs, adapted to experienced teachers' different learning needs and study the factors affecting the actual realization, legitimacy and efficacy of the design.

5. The Case: An Adaptive SPOC for Teacher Professional Development

By 2020, it will be a requirement that Danish primary school teachers have a bachelor degree in the subjects they teach. More than 10,000 teachers, who have for many years taught a course without being formally qualified, need professional development and therefore municipalities ask for new training concepts. There is a need for educational concepts that are flexible in relation to teachers' work situations and are based on the fact that the teachers already have acquired a number of professional skills. A number of municipalities (the customers) and University College Absalon (UCA, the provider) are in the process of examining whether the training format SPOC (Small Private Online Course) can solve this training task. As part of this process, UCA has established a research project with the aim of developing a design framework that can guide the development of SPOCs in our institution**.**

Methods. The project is methodologically inspired by Design-Based Research (DBR) [37, 38]. Informed by previous research in MOOCs, adaptive learning systems and learning Analytics, the design framework has been developed through iterative design experiments [39]. Several prototypes have been evaluated and redesigned. We have analyzed interviews with participants and teachers and made observations of the participants' interactions with each other and with the technology (the learning platform Moodle). Through these design experiments, it has been possible to develop a design framework consisting of a set of pedagogical design principles.

Design Criteria for an Adaptive SPOC. Based on prior research, we have defined a set of design criteria for the development of an adaptive learning design for SPOCs:

- Modeling of the learner must be based on documented effects.
- The development of an adaptive learning design must be based on a precautionary principle (ethical code), which means that we do not use stereotypical methods for modelling the learner.
- Modeling should (only) visualize 1) the learner's professional skills and 2) experience and skills to learn in a given training format, e.g. MOOCs/SPOCs.
- Adaptation performed by a technical system based on non-transparent algorithms cannot stand alone.
- Adaptation must be a dialogue (negotiation) between the learner and a teacher on the basis of one or more technically generated information.
- The adaption strategy should be recommendations and the adaptation process must be transparent and controlled by the learner.

The Design Framework. Based on a series of design workshops and three iterative design experiments, we have developed a design framework for the design of adaptive learning environments in formal education based on SPOCs:

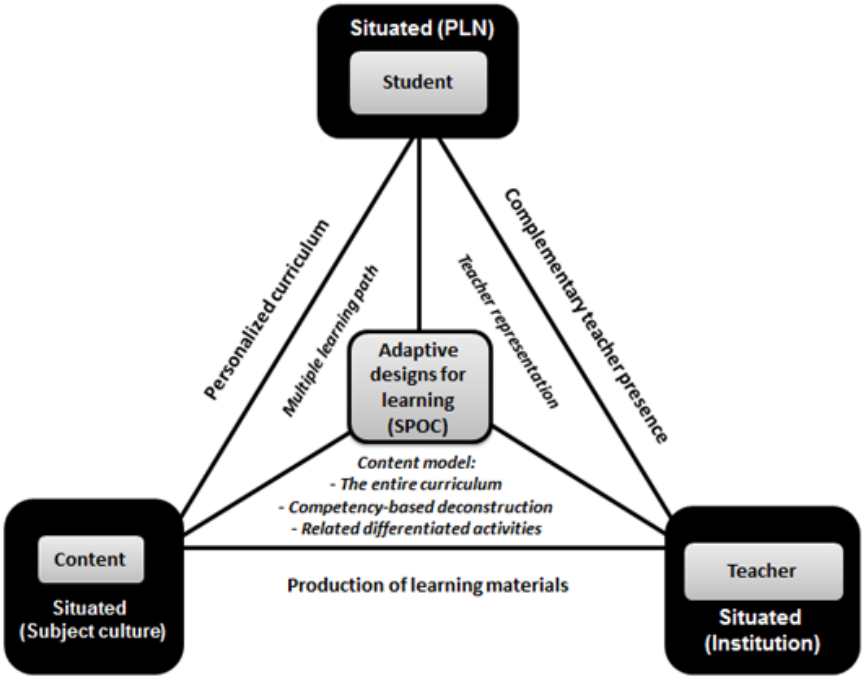

Figure 5. Design framework for an adaptive hybrid SPOC [inspired by 45].

The design framework visualizes three design levels:

Setting. The design framework is based on a well-known design model that frames the design as a setting for formal training with a student, content and a teacher. However, we are following the widespread criticism of this model and situate the three elements of the model in the context they are part of [23]. The student is part of a personal learning network (PLN). The content is part of a broader academic culture and its interpretation of the subject. The teacher is situated in an educational institution and more widely in an educational system. The development of a specific adaptive learning design must be based on the framing and the concrete anchorage of the three elements in their specific contexts.

Relationships. The framework visualizes the characteristics of the relationship between the designed elements described above. The relationship between the student and the content is characterized by a personalized curriculum. Each student has his or her own unique curriculum. The relationship between a student and the teacher is also characterized by complementarity. In traditional teaching concepts, the relation between a student and the teacher is the core of the instructional design and teacher presence is the starting point for concrete designs for learning. However, this is not possible in an instructional design where all participants have their own personalized curriculum. In a group of students who each have their own curriculum, it is not possible to realize a multiple relationship: a student - a content - a teacher. The relationship between student and teacher must be complementary if you want to support that all participants have a personalized curriculum. Finally, the relationship between the teacher and the subject also has a characteristic feature that is far from usual perceptions about being a teacher. The traditional role of the teacher is the lecturer who interprets a subject and mediates the relationship between the student and the subject in a face-to-face setting. The project shows that the relationship between the teacher and the subject must be transformed from a teacher role to an author role. The teacher is rather a designer, an author and a producer of a number of learning resources, a role that also entails that the teacher is part of a larger production team.

Principles. Level 3 in the model visualizes the design principles. These principles relate to each of the three characteristics described above.

Personalized Curriculum: Multiple Learning Paths. The design must be able to identify the participant's current skills - visualized in a competency profile. The design must be able to visualize a competence-gap in terms of a personalized curriculum. Finally, the design must be able to recommend a learning path that adaptively matches the learner's personalized curriculum. We will refer to the principle of potentially multiple learning pathways, and thus the possibility of recommending an adaptive personalized learning path for each student, as the design potential or *affordance* of the design.

Production of Learning Resources: The Content Model. In order to realize the principle of multiple pathways of learning, the educational institution in advance has to produce a content model, that covers the entire curriculum of the subject, includes deconstruction of the subject to competency units and guides the production of learning resources and forms of participation, which without progression are linked to each unit of competence. This design principle can be described as a *constraint* for adaptive learning designs. The design framework includes no constraints regarding the

choice of types of activity associated with specific stereotypes, learning styles, etc. The framework thus encourages the development of a number of different types of activity associated with each competency.

Complementary Teacher Presence: Representation of the Teacher. The final design principle is a key constraint for the design of MOOCs in general and thus also for an adaptive SPOC. Since the teacher cannot be present in a potentially multiple number of learning pathways, the teacher must be represented in the design. The teacher must be mediated in a form that minimizes the disadvantage of a learning design where the teacher cannot be physically present. The principle of complementary teacher presence can be formulated as a scale, and an educational institution must in each case decide the extent to which it will complement the asynchronous teacher presence with synchronous presence forms either online or on campus. Besides these asynchronous and synchronous presence forms, Christiansen & Rosenlund have put forward the concept of Presence-Absence as a certain form of presence that is characterized as: "The psychological state or subjective perception in which a part of or all of a student's perception fails to acknowledge the role of technology in his or her current experience of a learning situation involving a teacher represented digitally in such a way that he or she is recognized and acknowledged as a teacher" [40]. This can be done in numerous ways and one of them could be through meaningful videos where the teachers use e.g. humor and present some of their own thoughts on a subject or a discussion. It is crucial that students get the feeling that real human beings are behind the learning environment in which they participate.

Evaluation of the Design Framework. The evaluation of the developed design principles follows methods and guidelines from Design-Based Research [41, 42]. In our evaluation, we distinguish between the design principles outlined in the framework above, and *specific* designs for learning developed by individual teachers/authors in a given educational institutionalized context. In a DBR project, there is no straight line from the developed theory (design principles) and the actual design solution. "Design principles are not intended as recipes for success, but to help others select and apply the most appropriate substantive and procedural knowledge for specific design and development tasks in their own settings" [42]. Specific learning designs can therefore easily develop into *mutations* (legitimate or lethal), which research should subsequently study in order to revise the developed theory [43].

The designs developed by the teachers/authors, have been evaluated according to *feasibility*, *legitimacy* and *efficacy* [42]. The degree of feasibility, legitimacy and efficacy affects the *intended* design that an educational institution produces and offers to its customers. However, the intended design is not the same as the *implemented* and the *attained* designs. The intended design is what the design is set out to do. The implemented design is how it is actually used in practice by teachers and students, and the attained design is the specific outcome of the design – in our case the learning outcome [42]. An evaluation design must test both the intended, the implemented and the attained designs.

The evaluation was conducted using *alpha* testing and *beta* testing [42]. Our alpha trials have been controlled by the research team with maximum support for teachers and students. The aim was to test the feasibility of the design in our institution and explore the teachers' and students' assumptions about viability and impact on learning outcome. In our beta test, we have tested the SPOC in a real life context but still with some support. The goal has been to explore conflicts between the intended design and its implementation according to institutional feasibility and viability, map out fostering and hindering conditions for implementation and measure the initial impact on learning outcome.

6. Results

6.1. The Choice of Intended Design

By now, UCA has produced SPOCs in seven different subjects and has decided to produce SPOCs for all subjects taught in the Danish primary school by 2018. The SPOCs are for in-service training for experienced school teachers without formal qualifications, in the following referred to as "the students".

The first step before entering the course is self-assessment. On a scale from 1- 5 the student assesses his or her qualifications in relation to the objectives of the course, which are formulated in terms of competencies. The self-assessment is conducted with a tool developed within the project. On the basis of the student's input, the tool generates and visualizes a competence-profile illustrating the percentage of the curriculum, the student must study. This happens automatically on the basis of a simple algorithm that collects all of the competency outcomes rated 3 or less by the student. The developed tool also serves as a recommendation and navigation system that generates an adaptive match between the competence-gap and selected study themes. The SPOC platform for each of the 7 subjects is designed so adaptation is possible, no matter what skills the student needs to pass the exam. The curriculum in a subject is divided into a number of themes that are organized so they can be accessed without progression. Each theme is assigned a set of competencies that the students can acquire through study work, by accessing video resources, texts, exercises, quizzes and participation in peer-to-peer response, collaboration etc. Again, the system performs simple automatized adaptation to match the competency profile with the relevant study themes, but the recommendation system is supplemented by a guidance session with a teacher, because UCA wishes to supplement the technical recommendation system with a dialogue with each student. Through a 90 min. dialogue with a teacher, the self-evaluation is reviewed, and the teacher provides additional guidance on the selection of adaptive

themes and navigation in the SPOC platform. The evaluation shows that there is a high degree of fidelity **between** the design principles and the *intended* design of the 7 SPOCs that UCA has produced to this day.

6.2. The Implemented and Attained Designs

The evaluation of the implemented design shows that there are four different clusters of mechanisms that have significance for the attained design in different local contexts:

- The participants' perception of relevance and usefulness of the intended learning design including the recommendation system.
- UCA's introduction of the intended design to the students.
- The students' study conditions granted by their employer.
- The students' academic qualifications.

Implementation of the Recommendation System. In this paper, we have focused on the first clusters of mechanism and the implementation and effect of the recommendation system in particular. The evaluation shows that both the students and teachers find the recommendation system and the additional guidance session with a teacher useful at the beginning of the course, but subsequently the recommendation loses its value. The evaluation shows that the "recommendation system" appreciated the most by the students is situated practice within the SPOC, which means that the students only start to believe that they are competent once they have worked with the competency outcomes and the related resources in the SPOC. Furthermore, the evaluation shows that the most important recommendation system offered by this educational concept is the open access for all students which allows them to work with all competencies within a subject when they wish to do so. The opportunity to work with the resources for a full education programme is valued the most by the students, and in interviews they even express the wish to have continuous access to an archived version of the SPOC once they have completed the course.

The most crucial finding of the project in relation to working with recommendation systems is the fact that simply implementing a recommendation system at the start of a course is insufficient; a recommendation system can only support the development of adaptive and personalized learning paths for each student if the system is employed throughout the course. Moreover, this will only be possible if the full education program is temporarily and spatially transparent and available in relation to each student's wishes for their course of study. This presupposes a shift in our understanding of education from being a relation between a class of students, a teacher and the content to being a learning path within a learning environment where everything is available at all times and where a unique path is recommended for each student. Only then will we reach a changing paradigm, where the education system becomes a recommendation system rather than a matter of schooling.

7. Further Research

The discussions in this paper raise a number of questions in relation to educational adaptation, and further research within the field is required.

Firstly, the development of recommendation systems in educational design solutions should be followed and examined closely. The further development of recommendation systems should be carried out via experiments, iterations and guidance from researchers as well as teachers. Secondly, the emergence of various types of sub-MOOCs is likely to result in different types of adaptation forms and, presumably, adaptation in such MOOCs will play different roles in different contexts. Furthermore, the continuing development of sub-MOOCs calls for further research into what is required from teachers and students who interact with different types of recommendation systems [40].

The shift in education from educational systems requiring student adaptation to educational recommendation systems adapting to students' individual needs requires that new concepts for discussing education and adaptation are developed. Moreover, future research should explore how paradigm shifts occur within an educational setting and how such ground-breaking changes can be supported on an organizational level. Finally, we need to ask ourselves the question: What will be the consequences of educational systems mutating into a multitude of recommendation systems, and how can we meet the challenges and demands that will follow?

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The Effect of Vocational High School Administrators' Leadership Behaviors on Teacher Job Satisfaction

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Abstract The purpose of this research is to determine the effect of vocational high school administrators' leadership behaviors on teacher job satisfaction. The study group of the research consists of 21 technical teachers who work at vocational high schools in the city of Isparta. The data obtained have been analyzed by calculating the frequency, arithmetic mean, correlation and regression analyses. The vocational high school administrators exhibit all types of behaviors in every dimension of leadership at the level of "frequently". It has been understood that there is a significant correlation between the dimensions of administrators' leadership behaviors and teacher job satisfaction. Another considerable finding of the research is that the effect of individual-oriented leadership behaviors - one of the dimensions of leadership behaviors- on teacher job satisfaction is higher than the effects of other dimensions of leadership behaviors.

Keywords Leadership, Leadership Behaviours, Job Satisfaction

1. Introduction

In the 21st century, in which there is a competitive atmosphere, job satisfaction and leadership have become important issues for the education institutions that work with the intention of productivity and quality. Effective leaders and workplace have significant roles in the attainment of the objectives. At schools, school administrators are the ones who are primarily considered as leaders. An administrator is someone who organizes, leads, coordinates, influences, and controls the employees at schools in order to achieve the goals [1]. Another important thing is the performance of those who work with the leader, namely, teachers. Studies in recent years show that job satisfaction has a relationship with the performance of teachers at schools.

Besides being a multi-dimensional concept, job satisfaction can simply be defined as "the extent to which employees like their jobs". Job satisfaction is an emotional reaction from the employee to the business statement. Accordingly, it cannot be seen, it can only be expressed [2; 3; 4; 5; 6; 7; 8; 9; 10]. Job satisfaction is the reflection of the employee's emotional reaction to the job or to its certain aspects [11; 12]. The financial gain of the job, the level of employee satisfaction with the co-workers and the sense of happiness stemming from producing something are the signs of job satisfaction. This feeling makes the individual internally happy. Due to its being an emotional reaction, it is an abstract concept and a difficult term to measure. The signs of job dissatisfaction can be useful for understanding job satisfaction. Job dissatisfaction is reflected as behaviors, such as; reluctance to work, escaping from work, being absent from work, or leaving the work. While job satisfaction regulates the employee's social, physiological, and psychological health, the contrary situation leads to various unhealthy situations. When considered from institutional point of view, job dissatisfaction is most obviously reflected as productivity loss. Behaviors like slowdown of work, increase in absenteeism and occupational accidents, deterioration of work discipline, careless consumption of sources, increase in employee complaints, etc. are some other signs [13]. According to [14], job satisfaction is the variation between what employees expect from the job and co-workers, and how they perceive the job and co-workers. Meeting employees' expectations from work both increases job satisfaction and gives rise to achieve the goals in a more productive way.

For the effectiveness of institutions, school administrators should pay regard to all kinds of factors that may have an effect on productivity in a positive or a negative way. Just like in educational institutions, in-public utility institutions, the achievement level of institutional, individual and interchangeable goals plays an important role in job satisfaction of employees. The reason is that job satisfaction increases and decreases depending on the extent to which the organization fulfils employee needs and expectations.. The extent to which the organization fulfils employee needs and expectations is –on a large scale-- related to the leadership behaviors shown by the managers. Researchers assert that

leadership behaviors shown by the managers are the most significant factors of all essential factors that affect employee job satisfaction and complaints [15; 16; 17].

It seems that the concept of leadership in management emerged in the1960s for the first time. Leadership is a process which includes states like willingness, faith, commitment, voluntariness. In this process, many sources of power integrate and there exists an effect transforming the difficulties stemming from this integration into willingness, faith, commitment, and voluntariness [18]. A leader is someone who reveals the unapparent common thoughts and wills as an adopted goal and potentizes the members' secret power in accordance with this goal [19]. In the process of leadership, there is a leader and there are followers. The concept of "followers" evokes a passive behavior and commitment to the leader. However, today, in leadership approaches, a multidirectional communication between leader and followers has been emphasized [20]. Leadership is a concept analyzed and defined from different perspectives in various ways. In this case, leadership is a matter of management science and is a concept that can be addressed and analyzed in psychological, sociological, political and philosophical aspects as well as being related to occupational life [21]. Leadership has generally been defined in terms of personal characteristics, leadership behaviors, interaction model, role relations, perceptions of followers, the influence on followers, and its effect on the organizational culture. The definitions mostly emphasize a process of influence. However, in most of the definitions there is no common point or suggestion; nevertheless, they differ from one another in many aspects. Some of those differences are the use of influence and the person who influences, influence, leadership styles and organizational commitment, the attitudes and behaviors concerning the use of influence [22].

Leadership approaches have been examined in the related literature as four groups; approach of traits, behavioral approach, situational approach and modern approach [23]. According to the approach of traits, the leader is different from the followers in the aspects of his/her personal traits, individual talents, and physical properties [24] and this difference is the essential reason for his/her becoming a leader. However, while showing different leadership behaviors in similar settings can easily be explained by the approach of traits, the situation in which leaders having the same personality structure show different behaviors in different settings has become difficult to explain by means of this approach. This approach has been inadequate to explain the difference between leaders and non-leaders, and studies on leaders' behaviors have begun to emerge.

Studies conducted by behaviorists on the differences among leader behaviors have made behavioral approach a current issue. According to the behavioral approach, the leader's behaviors and the employees' maturity level determine the leader's effectiveness [25]. [26] Referring to the studies conducted by Ohio University, a leader has two types of behavior which are individual-oriented and institutional-oriented. The dimension in which the individual is taken into consideration includes such leadership behaviors as sense of mutual trust in interpersonal relations, solidarity, helping each other, and understanding the opinions and feelings of followers and showing respect. As for the institutional dimension, there are such leadership behaviors as putting institutional goals forward, fulfillment of reciprocal duties and responsibilities by the leader and followers, and enacting the whole team.

In the study conducted by Rensis Likert and his colleagues at the University of Michigan, two different leadership behaviors which are institution-oriented and individual-oriented have been prescribed [24]. While an institution-oriented leader shows such behaviors as drawing his/her strength from his/her position and controlling whether the followers fulfill their designated duties and responsibilities, exhibiting chastising and authoritative behaviors when necessary, an individual-oriented leader shows such behaviors as predicating delegation on, taking followers' personal growth and progression into consideration, prioritizing their happiness. It has been concluded that in the institutions managed by individual-oriented leaders, the levels of morale and success of the followers and productivity are high; as for the institutions managed by institution-oriented leaders, there is the exact opposite situation [27].

Since 1960s, together with leadership behaviors, the environmental features affecting those behaviors have been emphasized and "the contingency approach in leadership" has shown up. In this approach, it has been argued that there are no types of leadership which can be valid and effective in all circumstances [25]. A leader, in certain conditions and situations, can sometimes exhibit institution-preferred behaviors, sometimes individual-preferred behaviors, sometimes democratic behaviors, and sometimes autocratic behaviors [28]. According to this approach, just as there are no types of management that can be the best all the time and in all settings, there is no institutional structure that can be valid all the time and in all settings. In other words, a leader's behaviors depend on the situation.

In parallel with developments in the field of management science, studies on leadership issue have revealed some different initiatives besides the traditional approaches. These perspectives, which can be called modern approaches, [29] have included some new leadership styles in the literature of management science. According to [24], concepts like transformation, development, consolidation, vision and social responsibilities are at the bottom of these perspectives. Unlike the traditional approaches, modern approaches include types of behaviors that are oriented to the future, innovation, change, and reforms. In this new leadership approaches, the quality of the communication between the leader and followers is of capital importance.

Leadership Behaviors and Their Effects on Employees

Leadership behaviors have primarily been considered as

two-dimensioned, institution-oriented leadership behaviors and individual-oriented leadership behaviors. In the later years, change-oriented leadership behavior, which is regarded as one of the modern approaches, has emerged. An institution-oriented leader exhibits some typical behaviors such as; prioritizing necessary duties, oppressing the employees for them to do their duties, frequently controlling whether the duties are done, focusing on principles rather than relations, and regarding the employees as a means of fulfilling the duties. As for the individual-oriented leadership behaviors, these behaviors prioritize morale and motivation, success, job satisfaction and happiness of employees, besides the institutional goals. In change-oriented leadership behaviors, flexibility in perspectives on incidents, creating opportunities for development and participation are the essentials. Leadership behaviors should not be regarded as a certain preference among the approaches mentioned above. There is no type of leadership behavior which is guaranteed to be successful in all circumstances. Although individual-oriented leadership behaviors make the employees achieve high satisfaction level in some circumstances, some leadership behaviors placing importance on the individual and change can supply higher satisfaction level in some institutions.

When a leader doing his/her leadership job, which type of leadership behaviours (individual-oriented or change-oriented) he/she exhibits depends on the organizational structure, the scope, activity diversity, and environmental problems [30; 31; 32]. As it has been indicated by [24], a leader can sometimes exhibit institutional priority behaviors, sometimes individual priority behaviors, sometimes democratic, sometimes autocratic behaviors depending on the setting and conditions. In addition, in institutions with high level of productivity, the leader can integrate the institution-oriented and individual oriented behaviors. What matters here is the leader's ability to use available resources, primarily human resources, to achieve their goals. Many researches that investigate the effects of leadership behaviors on job satisfaction have important places in the literature. The most important ones of those researches have been conducted with [16] healthcare staff [33], university instructors, [34] and [35] primary school teachers. These investigations have emphasized the importance of managing individual or change-oriented leadership behaviors in corporate goals. In the vocational high schools which are production-oriented educational institutions, it is expected that the institutional aims are important, but the educational institutions are always in favor of the individuals and the change in priority. The vocational high schools that are interested in every part of the society also have the input, the processing, the output, the raw material. Teachers have a direct influence on students and they are functioning. Teachers directly influence the achievement of the institutional objectives at the desired level by means of their knowledge, skills and attitudes. This requires school administrators to be more responsive to teachers' job satisfaction. The effects of managers' leadership behaviors on teachers have been examined at various stages of education, but vocational schools have not sufficiently taken into account in the researches. Therefore, in this research, the aim is to determine the leadership behaviors of vocational high school administrators on the job satisfaction of technical teachers.

2. Method

This research is a descriptive study carried out through the survey model. The sample of the study is composed of all the technical teachers working in the vocational high schools in Isparta. Vocational high schools can be defined as educational institutions that provide vocational training in industrial technical fields together with general cultural courses aiming to provide a common general culture at secondary level.

As a data collection tool, "leadership behavior" and "job satisfaction" scales were developed. Benefiting from the survey questions used in previous studies [36; 14; 37], an item pool was established; 98 items were related to leadership behaviors, 62 items were related to job satisfaction. The selected participants from the study group were requested to code the items as positive, negative and none. Questions that most participants did not classify positively or negatively were removed from the item pool. After this extraction, the remaining questions were revised in line with expert opinions and the scale was developed. A 5-point Likert type scale was used to measure the scale items. Factor and reliability analyses were performed for construct validity of the measurement tool. The suitability of the data for factor analysis was examined by the Kaiser-Meyer-Olkin (KMO) coefficient and the Barlett test. KMO = 0.931 and Barlett test score = 4008.61 were found for the leadership behaviors of the scale. On job satisfaction part of the scale, KMO = 0.926 and the Barlett test value is 2118.51. Dimensions of managerial leadership behaviors of the scale were called; Institution-oriented leadership behaviors, individual-oriented leadership behaviors, and change-oriented leadership behaviors [14]. The first dimension of the scale, leadership behaviors consisted of 10 items as "institution-oriented" leadership behaviors, the second dimension consisted of 14 items as individual-oriented leadership behaviors and the third dimension consisted of 11 items as change-oriented leadership behaviors. The job satisfaction part of the scale is one-dimensional and consists of 19 items. The factor load values of the institution-oriented leadership behavior dimension of the "leadership behaviors of managers" section of the scale ranges from 0.63 to 0.84. The variance load value is 0.64. The factor load values of the change-oriented leadership behavior dimension range from 0.66 to 0.87 and the variance load value is 0.66. The factor load values of the individual-oriented dimension range from 0.72 to 0.92 and

the variance load value is 0.71. Factor load values of the "job satisfaction" section of the scale are between 0.61 and 0.87 and the variance load value is 0.61. The reliability of data collected through the scale was tested by means of Cronbach Alpha coefficient. As a result of the analysis, the Cronbach Alpha value of the leadership section is 0.97 and the Cronbach Alpha reliability value of the job satisfaction section is 0.98. In the collection and analysis of the data, 151 teachers of the total 160 technical teachers were subjected to the survey by the researchers and their assistants with representative power [3], with 3% sampling error. However, 121 scales were subjected to analysis. The frequency and percentage values of the demographic variables were determined in order to obtain a general view of teachers' personal information in the research. Then, the arithmetic mean and standard deviations of the answers given to the scale were calculated and the level of leadership behaviors of the vocational high school administrators was determined. A correlation analysis was conducted to determine the direction and degree of the relationship between leadership behaviors and job satisfaction. The effect of leadership behaviors on job satisfaction was examined by regression analysis and significance was tested at the level of 0.05.

3. Findings and Interpretations

In this section, the findings of the research were included. Frequency and arithmetic averages of scaled responses were calculated to determine the extent to which vocational high school administrators performed institution -oriented, individual-oriented and change-oriented leadership behaviors, and the significant ones of these values are given in Table 1.

As seen in Table 1, the overall average of institution-oriented leadership behaviors was found as ($\overline{X}$= 3.58). According to this finding, it can be said that vocational high school administrators use leadership oriented behaviors "mostly". When looking at the levels of leadership behaviors that constitute this dimension, the item "attaches importance to the rule" takes place on the top with ($\overline{X}$= 4,0); the item "inform" takes the last place in the order with ($\overline{X}$=3,10). When the same table was examined, it was found that the general average of individual-oriented leadership behaviors is ($\overline{X}$=3, 63). According to this result; it seems that vocational high school administrators "often" show individual-oriented leadership behaviors. When looking at the levels of leadership behaviors that constitute this dimension, the item "the mistakes are seen as an opportunity to learn" takes place on the top with ($\overline{X}$=3,91); the item "exhibits fair behaviors" takes the last place with ($\overline{X}$=3,42). The fact that the level of vocational high school administrators' individual-oriented leadership behaviors is at a high average is an indicator showing that the vocational high school administrators perform a modern management. It is institutionally important for the vocational high school administrators to show leadership behaviors that attach importance to teachers.

Table 1. The extent to which vocational high school administrators show Leadership Behaviors

Dimension		N	□	S
Institution-oriented Leadership Behaviors	1. Attaches importance to the rules	1,21	4,01	1,14
	2. Emphasizes work supervision	1,21	3,96	1,07
	3. Provides source.	1,21	3,71	1,16
	4. Exhibits transparent management	121	3,60	1,27
	5. Has a developed accountability	121	3,57	1,26
	6. Consistent in practice	121	3,55	1,31
	7. Cares about the institutional culture	121	3,50	1,36
	8. Cares about team work	121	3,43	1,22
	9. Include teachers in decision making	121	3,40	1,13
	10. Informs	121	3,10	1,33
	Total	**121**	**3,58**	**1,23**

Table 1. The extent to which vocational high school administrators show Leadership Behaviors (Cont.)

Dimension		N	$\overline{X}$	S
Individual-oriented Leadership Behaviors	1. Sees the mistakes as an opportunity to learn	121	3,91	1,27
	2. Shows respect	121	3,78	1,17
	3. Appreciates good work.	121	3,76	1,33
	4. Trusts teachers	121	3,74	1,25
	5. Shows affinity and tolerance	121	3,62	1,19
	6. S/he is trustworthy	121	3,57	1,28
	7. Create a friendly environment	121	3,55	1,43
	8. Provides an opportunity for development	121	3,52	1,32
	9. Cares about rights	121	3,47	1,40
	10. Exhibits fair behaviors	121	3,42	1,30
	Total	**121**	**3,63**	**1,29**
Dimension		**N**	$\overline{X}$	**S**
Change-oriented Leadership Behaviors	1. Makes plans for the future	121	3,95	1,18
	2. Supports new and different ideas in the implementation of jobs	121	3,65	1,09
	3. Decides quickly	121	3,62	1,11
	4. Respects different views	121	3,61	1,27
	5. Develop different ideas	121	3,58	1,13
	6. S/he is open to change	121	3,57	1,17
	7. Use brainstorming methods frequently to solve problems	121	3,56	1,26
	8. Tries new ways in problem solving	121	3,54	1,17
	9. S/he does not avoid taking risks	121	3,41	1,33
	10. S/he is open to criticism	121	3,28	1,30
	Total	**121**	**3,57**	**1,22**

Table 2. The relationship between Leadership Behaviors and Job Satisfaction

		Institution-oriented Leadership Behaviors	Individual-oriented Leadership Behaviors	Change-oriented Leadership Behaviors
JOB SATISFACTION	Pearson Correlation	.739**	.776**	.737**
	P	0.00	0.00	0.00
	N	121	121	121

*p=0.05 significance level

**p=0.01 significance level

According to Table 1, vocational high school administrators also use change-oriented leadership behaviors "often" with ($\overline{X}$=3,57) as behaviors in the other dimensions. When we look at the extent to which they exhibit the leadership behaviors in this dimension, while the item "makes plans for the future" takes place on the top ($\overline{X}$=3,95), "open to criticism" takes the last place with ($\overline{X}$=3,28). In the research, a correlation analysis was performed to determine whether there was a significant relationship between leadership behaviors and teacher job satisfaction, and the findings of this analysis are given in Table 2.

When Table 2 is examined, it is seen that the relationship among all dimensions of leadership behaviors and teacher job satisfaction is positive and high. However, while the highest relationship level was found with the individual-oriented leadership behaviors (r=0.776, p<0.01), the lowest relationship level was found with the change-oriented leadership behaviors (r=0.737, p<0.01). According to these findings, individual-oriented leadership behaviors cause teachers to be more satisfied with their job.

The effect of leaderhsip behaviors of vocational high school administrators on teacher job satisfaction was examined by regression analysis. Leadership behaviors dimensions were taken as variables to determine manager leadership behaviors dimensions affecting job satisfaction. The results of regression analysis of these analyzed variables are given in Table 3.

Table 3. The results of regression analysis regarding the effect of manager leadership behaviors on teacher job satisfaction

Variable	B	Standard Error	B	T	P	Binary r	Partial R
Stable	,81	.221	-	3,89	.001	-	-
Institution-oriented Leadership Behaviors	,12	,156	,513	,66	,501	,739	,067
Individual-oriented Leadership Behaviors	,46	,192	,514	2,40	,016	,777	,238
Change-oriented Leadership Behaviors	,13	,178	,167	,76	,443	,761	,077

R=0.782, R^2=0.61 F=(3,96) =50,22, p=.000

According to the findings in Table 3, it can be pointed out that the variables of individual-oriented, change-oriented, and institution-orientedleadership behaviors of vocational high school administrators have significant effects on teachers' job satisfaction (R = 0,783, R2 = 0.61p <.01). These variables account for about 61% of the variance in teacher job satisfaction.

Relative significance order of the predictor variables over the job satisfaction according to the standardized regression coefficient (β) is as; individual-oriented leadership behaviors, institution-oriented leadership behaviors, and change-oriented leadership behaviors. When the results of the t-test on the significance of the regression coefficients are examined, it is seen that "institution-oriented leadership behaviors" are important predictors of teacher job satisfaction. On the other hand, it is seen that the variables of change-oriented and institution-oriented leadership behaviors do not have a significant effect on teachers' job satisfaction.

4. Conclusions and Recommendations

According to the research findings, vocational high school administrators use all three leadership behaviors "most of the time". It can be said that administrators shows all three leadership behaviors, however they show more individual-focused leadership behaviors than other two leadership behaviors that were found in the study. The results of this research coincide with [39; 40]'s reseach results. Managing the vocational high schools with an individual-oriented management approach will affect the job satisfaction in a positive way. The happiness of the teachers in the educational environment will be reflected positively to the student-teacher relationship and the productivity of the education will increase. The fact that the psychological, sociological and economic needs of the teachers, the most important constituent of education, are taken into account by the administrators is also a positive development in terms of the future of vocational high schools [41].

In the research, the institution-oriented leadership behaviors of vocational high school administrators was higher than the rest of the leadership behaviors. This ratio also indicates that vocational high school administrators cares about their institutions as much as they care about their employees. This result is similar to the research conducted by [42] on university administrators' leadership behaviors. In that vein, in the research conducted by[43; 39] institution-oriented leadership behaviors were found meaningful in job satisfaction, which is consistent with the results of our research. As is known, job satisfaction is a feeling that is experienced when the work of the employee and what s/he has achieved jibe with his/her needs and personal values [44]. Job satisfaction may vary depending on the person's priorities and expectations. Even the same person may have different satisfactions at different times depending on such factors as job change, promotion, changes in the lifestyle, changes in the country's economy [45; 46; 47; 48].The high level of institution-oriented leadership behaviors of high school administrators may also be due to the fact that the unemployment rate in Turkey is 13.7% [49], and also because teachers can push some of their needs into the background and are happy to have a job. Taking all of these into account, it is normal to have such results.

In the research, the fact that vocational high school managers show change-oriented leadership behaviors with ($\overline{X}$= 3.57) is not an expected result because the basic function of vocational high schools, which produces the qualified human power needed by the country besides being known to have a significant influence on society, is not limited to transferring knowledge, conducting corporate activities and meeting the needs of the individual. To serve for the society, to lead [50; 51], to become a means of production, and to focus on the development and transformation of human resources are among the duties of these institutions. For this reason, vocational high school managers are expected to exhibit change-oriented leadership behaviors as much as individual-oriented leadership behaviors. However, the results of the survey did not appear as expected. Research [53; 54; 55; 26; 56; 57; 58; 35] results show that leadership behaviors that are mostly exhibited by principals are in the dimension of change-oriented leadership behaviors. In addition, that the school administrators mostly exhibit change-oriented behaviors has been found to be as a positive development. As indicated by [59], change-oriented leaders do not regard every teacher as having similar characteristics, but as a separate personality. The leadership competencies of vocational high school administrators should be high in the sense of focus on change. Because the technical teachers who work in the vocational high school make a difference in the personality traits by making more use of the technology and the hand skills.Because, the technical teachers who work in the vocational high schools make different use of the personality traits by making more use of the technology and hand skills.

It is unlikely that vocational high school administrators will be able to carry out change-oriented leadership behaviors at the desired level, since they have been

nominated without having received an undergraduate or master's degree in the field of educational administration and without investigating whether they have change provider characteristics .The reason is that management is regarded as a field of science although it is used to be regarded as an art in the past [61] [62]. It is a recognized fact that leadership behaviors can be taught to persons through education and the changes desired in these behaviors can be made [63; 64]. People are not created innately as good managers, but management art and knowledge are gained only through learning [65]. In order to develop their vocational high schools, they have revealed in their research that vocational high school administrators should be given a serious training in educational leadership and management of school organizaitons[66]. We can build up the vocational high schools that will accelerate social change with the construction of strong school administrations that can lead change and development. [67] Therefore, school administrators should be trained in educational management field and carry leadership qualities personally. In addition, it should not be forgotten that the nature of the purpose to be achieved, the talents and expectations of employees, the characteristics of the organization, and the experiences and personality traits of leaders and followers also have significant influences on school administrators' leadership styles.

Although vocational high school administrators are expected to exhibit mostly "change-oriented leadership behaviors", that the results of the individual-oriented, institution-oriented and change-oriented leadership behaviors are close to each other is also important. Because different conditions require different styles of leadership. There is no single and best leadership style for any situation or institution. The style of leadership may vary depending on circumstances [70; 71]. In this regard, the results of this research support the idea that the leader is created by the leadership environment and leadership behaviors may vary depending on the characteristics and requirements of the environment [72]. The presence of educational environments in the vocational high school will reduce the differences in the behaviors of the administrators so that the level of teacher job satisfaction will increase.

Research conducted show that there is a meaningful relationship between leadership behaviors and job satisfaction [73; 74; 75; 76; 77; 39; 78; 14; 79; 33]. There are also studies in the literature having found that there is no relationship between individual-focused leadership behaviors and job satisfaction [80]. Although the relationship between leadership behaviors and job satisfaction was found in research, the highest relationship was found mostly between individual-focused leadership behaviors and job satisfaction. As a result; when the literature on educational management is examined, it is seen that the issue of leadership and job satisfaction is very wide. The main reason underlying the efforts of scientists to determine the leadership behaviors of contemporary school administrators is that administrators are the most important constituents in creating a contemporary, effective school [81]. The role of the administrators in teacher training is also important in terms of seeing the failures in-situ, the continuous involvement in the school system, which are the most basic unit of educational services, and being a bridge between theory and practice [82]. There are different views on leadership behaviors that school administrators should have. However, as emphasized in this research, the most widely accepted ones are individual-oriented and change-oriented leadership approaches. When the related literature is examined, it is seen that especially individual-oriented and change-oriented leadership behaviors are highly effective leadership styles in the dimensions of organizational commitment, job satisfaction, performance etc. According to the findings of this research, there is an important relationship between individual-oriented leadership behaviours and teachers' job satisfaction. As the leadership behaviors of vocational high school administrators approach towards individual-oriented leadership behaviors from institution-oriented leadership behaviors, teacher job satisfaction level increases. For this reason, it is important for school administrators to be aware and educated about individual-oriented leadership behaviors in order to increase the organizational commitment of employees.

Researchers can contribute to better understanding effect of administrators' leadership behaviors on teachers' job satisfaction by also doing quantitative and qualitative researches on administrators of preschool, primary school, junior high school, general high schools.

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Professional Interactions: Negotiation and Expression for Future Physicians and Healthcare Providers

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Abstract The rapid pace of change in medicine requires doctors to be effective conflict mediators and negotiators in the clinical workplace, and a multitude of research connects strong physician-patient communication to improved patient outcomes. Disparities in such skills exist among medical students and professionals, and are neither taught nor evaluated in a standardized fashion in U.S. medical school curriculums. A structured course would benefit patients by providing protected time for medical students to refine these skills. Our proposed course, titled "Professional Interactions: Negotiation and Expression for Future Physicians and Healthcare Providers" and referred to hereafter as PINE, is outlined here to provide a starting point for those seeking to create or supplement a similar course at their institutions. PINE, ideally, would tap the multidisciplinary expertise of leaders in medicine, the humanities, business, local community organizations, and education to facilitate student engagement with a variety of topics in interpersonal communication and negotiation.

Keywords Problem-solving, Negotiation, Communication, Conflict Resolution, Inter-professionalism

1. Introduction

Effective communication, in its many forms, is a requirement for success in virtually every profession, including healthcare. Research suggests that there are discrepancies in communication skills among providers, which contribute to lack of patient engagement, medical errors, and potentially malpractice suits [1-3]. Likewise, there is a wealth of literature tying effective communication and interaction to improved health outcomes and quality measures such as adherence to treatment, satisfaction ratings, patient participation in care, and self-management [4-9].

Fundamentally, strong communication facilitates delivery of patient-centered care, integrating biomedical management of a patient's disease with attention to social, cultural, and other aspects of the patient [10-12] to provide better treatment [13].

In addition to effective communication, patient-centered care also entails problem solving, an equally important skill area in medicine. For the purposes of PINE, problem solving will refer specifically to negotiation, which, in turn, encompasses stewardship. "Stewardship" was the term used in an AMA Viewpoints post [14] to specifically describe the responsibility of providing the best patient care through prudent use of limited resources. On a broader level, situations in which medical advice, patient viewpoints, and administrative goals may differ are opportunities for negotiation and conflict transformation [15], which in turn may help patients and providers strengthen their relationships with one another. With the advent of healthcare reform, managed care, the "employed physician," and other changes, American medicine has become increasingly complex and interdisciplinary. Future physicians can expand their capacity for effective practice when they are well-rounded professionals [16-18] and problem-solvers in both scientific and non-scientific contexts.

2. Significance

As of this writing, communication and negotiation courses are neither official medical school admissions requirements nor medical school curriculum components [19]. Current means of evaluating these skills in applicants, which include brief essays, traditional interviews, and even Multiple Mini Interview stations, remain subjective, limited, situational, and inconsistent. This contrasts with evaluation of student knowledge for arguably less-used disciplines such as physics and organic chemistry, which are standard academic

prerequisites and longstanding features of the Medical College Admission Test® (MCAT).

Once accepted to medical school, students complete preclinical coursework that may only sporadically reference those skills in isolated lectures or activities, if at all. Current clinical exams and patient exposure experiences provide standardized testing for core clinical skills and maneuvers, but do not test or establish organized, bottom-up communication or negotiation skill sets that can be adapted and utilized in a healthcare setting.

Thus, it is not surprising that there can be striking discrepancies of communication and negotiation ability among students and healthcare providers. Given that communication skills actually worsen for students throughout medical school in the absence of training [20], and that patients are even more concerned with physician expression of care than with knowledge [21], it is clear that a reflective, longitudinal means of developing and assessing communication and negotiation skills is warranted.

3. Description

While changes in undergraduate coursework or medical school admissions requirements are possible solutions, our focus here is on medical students, who have already been screened by admissions committees for demonstrated proficiency in the basic sciences. We propose our course, "Professional Interactions: Negotiation and Expression for Future Physicians and Healthcare Providers" (PINE) to provide opportunities for structured learning time for physicians-in-training to develop strong communication and problem-solving skills. Such a course would add educational value through both its content and longitudinal arrangement, allowing for continual reinforcement and formal evaluation during the preclinical and clinical years of medical school. The course's strengths would stem from a powerful combination of diversely sourced learning materials, inter-professional expertise and learning opportunities, and an active, engaging teaching and learning environment. Principles of communication and negotiation will be taught with a focus on application in clinical contexts, with the communication component ideally preceding the negotiation component to provide an appropriate foundation for the latter. Provided below are suggestions for PINE's curriculum and logistics.

Learning Objectives

At the end of this course, students will be able to:

- **Identify** disparate styles of communication and **gain insight** on their preferred styles, to be able to **adapt** as future clinical situations require.
- **Understand and apply** basic negotiation principles and problem-solving frameworks to **defuse** conflicts and **strengthen** relationships with patients and colleagues.
- **Analyze and evaluate** the conditions that foster team effectiveness, the factors that can disrupt team performance, and the system features that enable temporary, emergent teams to coordinate problem-solving approaches.
- **Become** strong interviewers who can also **take** a medical history consistent with their level of training.
- **Write and speak** at a level consistent with a professional career.
- Effectively **present, explain, and teach** medical and scientific concepts to others with similar and dissimilar backgrounds.
- Efficiently **navigate** research databases and online healthcare references, and be able to **distinguish and discuss** misinformation with patients.
- **Gain** awareness of the medical, cultural, and other beliefs of those from diverse backgrounds, and **consider** these in the contexts of communicating and negotiating as a healthcare provider.

Communication

Lecture 1: The Road Ahead

- Course Introduction/Logistics
- Understanding Your Personal Style: Analytical, Intuitive, Functional, Personal (Quiz) [22]

Lecture 2: Written Expression

- Professional emails and letter writing
- Effective Phrasing vs. colloquialisms
- In-class workshop/homework

Lecture 3: Digital Communication I

- Intro to patient confidentiality
- Intro to electronic health records
- Intro to telemedicine

Lecture 4: Digital Communication II

- Medicine and social media
- Effective use of medical apps
- Medical blogging/journalism
- Pharma advertising to doctors and patients

Lecture 5: Digital Communication III

- Using and searching literature databases and e-libraries within institutions
- Assessing source validity and accuracy, and discussing misinformation with "web-savvy patients"

Lecture 6: Visual and Pedagogic Expression

- Elements of an effective presentation, with focus on presenting research or lectures on medical topics (builds off Lectures 2 and 5)
- Elements of effective visuals
- Sample grand rounds or conferences (videos/demos;

encouraging students to sit in on grand rounds as schedules permit)

Lecture 7: Patient Interviews I: Transition

- Basic Interviewing skills (non-medical)
- Establishing trust; building rapport
- Subtle Language: Non-verbal cues (tone, dress, body language, etc.)
- Giving and receiving appropriate feedback and criticism
- Practice interview sessions/scenarios

Lecture 8: Patient Interviews II: The Basics

- Elements of medical history taking
- Explaining medical jargon and complex diseases or conditions to patients (builds off Lecture 6)
- SOAP note-writing (builds off Lecture 2)
- Standardized patient practice sessions (builds off Lecture 7)

Lecture 9: Patient Interviews III: Sensitivity

- Asking about sensitive topics (drug use, sexual activity, etc.)
- Delivering bad news; showing empathy
- Videos, practice cases
- Standardized patient practice sessions

Lecture 10: Patient Interviews IV: Difficulty

- Methods for Difficult Patients
- Methods for Hostile or Unethical Situations
- Videos, practice cases
- Standardized patient practice sessions

Lecture 11: Patient Interviews V: Diversity

- Communication nuances across cultures, genders, ages, socioeconomic conditions
- Special services (foreign language, blind, deaf interpretation; communicating with mentally challenged patients)
- Standardized patient practice sessions

Lecture 12: Allies in Healthcare

- Communicating within a hierarchy (direct superiors, hospital management, etc.)
- Communication across a team (other physicians, allied health providers, etc.); effective hand-offs
- Practice cases for interprofessional teams of medical, nursing, PA, and other professional students

Negotiation

Lecture 13: Getting to Yes

- Intro to principles of negotiation and conflict resolution
- Distributive bargaining
- Mutual gains model
- Identifying one's preferred styles
- Assigned reading: Fisher and Ury's *Getting to Yes*

Lecture 14: Working with Emotions

- Understanding and utilizing emotions in negotiation
- Reaching mutual understanding; psychology of rapport-building (builds off Lecture 7)
- Pre-assigned videos or cases; in-class simulations
- Assigned reading: Fisher and Shapiro's *Beyond Reason*

Lecture 15: Negotiating with Numbers

- Principles of bargaining
- Intro to health economics
- Insurance claims, salaries, contracts, etc.
- Pre-assigned videos or cases; in-class simulations

Lecture 16: Negotiating with Values and Beliefs

- Intro to Bioethics
- Common ethical and other dilemmas for healthcare professionals
- Nuances of different belief systems (awareness of different cultural/religious views on aspects of medicine and how to work with them)
- Pre-assigned videos or cases; in-class simulations

Lecture 17: Negotiating with Power Differentials

- Builds off Lecture 10
- Working effectively with superiors
- Methods for handling a hostile workplace
- Difficult Patients (hostility; nonadherence; political or economic leverage, etc.)
- Pre-assigned videos or cases; in-class simulations

Lecture 18: Negotiating with Power Differentials II

- Builds off Lecture 11
- Intro to patient advocacy
- Nuances of diverse backgrounds (impact of culture, gender, age, socioeconomics, education, etc. on negotiation)
- Contemporary cross-cultural issues
- Awareness of local community outreach efforts and social resources
- Pre-assigned videos or cases; in-class simulations

Lecture 19: Leadership and Teamwork

- Builds off Lecture 12
- Principles of Leadership
- Team dynamics, inter-professionalism, shared or group decision-making)
- Pre-assigned videos or cases; in-class simulations

Lecture 20: Improvisation

- Improvisation/acting exercises
- Pre-assigned videos or cases; in-class simulations

Lecture 21: Negotiating Using Technology

- Dynamics of communicating over webcam, phone,

or instant messaging
- Pre-assigned videos or cases; in-class simulations

Possible Lecturers

- Medical faculty
- Research faculty/medical librarians
- Humanities faculty (communication, ethics topics)
- Hospital ethics committee members
- Hospital chaplains
- Speaking coaches, journalists, app developers, etc.
- Business/law faculty for negotiation and economics topics
- Community leaders (cultural, religious, etc.) and social advocates for diversity and outreach topics

Possible Materials

- Primary literature
- Books (negotiation or communication texts)
  - Required negotiation text: Ury's *Getting to Yes*; Ury's *Getting to Yes with Yourself*; Chris Anderson's *TED Talks*
  - Required communication texts: Beebe and Mottet's *Business & Professional Communication: Principles and Skills for Leadership*; Zoller and Preston's *You Said What?!: The Biggest Communication Mistakes Professionals Make (A Confident Communicator's Guide)*
  - Other supplemental texts per instructor discretion
- Online articles
- Multimedia resources
- Negotiation simulations and exercises
- Case studies from Harvard Business Publishing, etc.
- Videos
- Standardized patient vignettes or practice cases
- White coat pocket cards with negotiation and communication reminders

Possible Activities

- Guest lectures
- Small group activities
- Discussions
- Workshops
- Problem-based learning cases (PBL)
- Practice interviews
- Inter-professional sessions
- Practice individual interviews
- Standardized Patient interviews/demos

Possible Assessments

- Short, multiple choice assessments with NBME®-style clinical vignettes
- Many-on-one (students with faculty) assessment interviews or simulations
  - Videotaped for review, with immediate feedback sessions and reflection surveys
- Skill-area rubrics for pass/fail evaluation
  - Possible use of modified checklists used for current clinical medicine courses
  - Targeted Evaluation forms
- Faculty-student as well as student-student end-of-course evaluations for ongoing improvement
- Teach-back presentations
  - For example, presentation skills could be demonstrated via "teach-back" lectures on concurrent basic science content for first year students or review lectures in Year 2 for new first year students

Possible Grading Scheme

- We recommend for this course to be designated pass/fail as most medical students' efforts should still be devoted to their basic science coursework.
- We recommend for 30% of points to be from multiple choice assessment and assignments, and 70% of points to be from final simulations assessment evaluations. Students must score 70% of total points to be eligible to pass the course. We leave the specific assignment weights to course directors' discretion.

4. Considerations

Scarcities of multiple resources are important obstacles to overcome in the implementation of an involved and multifaceted course such as PINE; we address several potential problems and workarounds here.

Financial and Human Capital: Counterintuitive to staggering tuition rates, medical student education is generally an expensive undertaking for institutions, and assembling the faculty and staff to teach an additional course could pose a considerable financial burden. Additionally, available staff, personnel, and community resources differ by institution and location. For instance, not every institution or region has easy access to a business or law professor who can lecture on bargaining, or social workers who can lecture on community outreach. Low-cost academic materials and means of training instructors and personnel would likely be essential to initiating this course. Modest volunteer stipends or gifts could be rewarded to standardized patient volunteers, guest speakers, and others. Telecommunication and existing open-access resources available online would facilitate course material development and distribution of ideas, especially in more resource-deficient locations. Such resources could include documents, Citrix® interactive webinars, texts, vignettes, video recordings of professional-led workshops or conferences, site visits, etc.

Furthermore, existing courses that address concepts overlapping those of PINE could be adapted, modified, or reorganized for resource efficiency and enrichment.

Institutional curricular time: most medical school curriculums are already on tight schedules [23]. To not encroach on basic science lecture time and overtax students, we suggest that PINE be a once per week, 90-minute lecture preceding a 30-minute workshop, demonstration, or other in-class activity, with scheduled break(s) as needed, and mandatory attendance. Lectures may be shortened, extended, or sub-divided as needed to accommodate topic length. Videos, cases, and readings, along with relevant, brief open-ended questions, should be pre-assigned as appropriate to provide background and/or preparation for class discussions and activities. As addressed previously, grading for this type of course is recommended to be pass/fail, as most curricular time will still be devoted to basic science.

Educational Relevance: This course is fundamentally an interactive journey and its benefits to students are heavily dependent on engagement. Medical students are generally spread thin with regard to their coursework and extracurricular commitments [24], and the importance of board exam scores for residency match applications, understandably, exerts pressure on students to focus on learning topics directly "relevant" to career advancement. Given this, course staff discretion regarding when to deliver certain lectures is crucial for effective implementation and fulfillment of educational objectives. In its most effective form, this course should not be a monolithic block, but rather, a scattered seminar series, with lecture order and style at course directors' discretions. For instance, the lectures on patient interviews should be intuitively saved for periods immediately preceding clinical rotations and other patient encounters, the timing of which can differ substantially by institution. For evaluation purposes, multiple-choice, NBME®-style clinical vignettes could serve as a quantifiable means of assessment that also prepares students for future exam-taking.

Limitations of Human Memory: The reality of synaptic pruning is such that our retention of information is on a "use it or lose it" basis. PINE attempts to provide an active and engaging learning environment in which students can develop, reinforce, and fine-tune their skills longitudinally. Research literature supports the importance of practice in retention [25], and if teach-back is effective for patient education [26,27], it should be effective for students, as well. In addition to traditional planned redundancy and integrative lecture progression, the student group activities and evaluative teach-back presentations should provide excellent opportunities to practice and solidify the principles and skills. Even more importantly, we encourage course participants to seek out clinical and real-world opportunities to practice and apply the principles with the help of faculty and other leaders. If simulations are akin to dissector manuals, then these experiences are analogous to gross anatomy lab.

Adaptability: An essential quality of PINE is utility through flexibility. The course structure and content should be continually modified as seen appropriate and per student, faculty, and participant feedback. Further, while this course is intended for medical students, other health professionals could benefit, as well. Nurses, physician assistants, pharmacists, social workers, occupational therapists, physical therapists, and even precocious pre-health undergraduates will be working alongside physicians under similar work conditions. With the proper intra- and inter-institution cooperation and logistical coordination, this extension to wider audiences would expand PINE's impact and relevance. In the absence of a devoted nationwide network and collaborative organization that oversees and maintains a standard syllabus, PINE would likely remain provincial in reach and vary in form across locations. Nonetheless, research supports its merits and potential benefit, and implementation at even one institution would have a positive impact.

5. Implications

The field of medicine is constantly changing. While knowledge can become obsolete, skills are adaptable. Physicians-in-training will always need strong communication and negotiation skills to interact well with patients and providers, provide quality care, prevent and defuse conflicts, and represent the medical community effectively. We envision that our course would help healthcare professionals develop these tools needed to keep pace with future trends and catalyze better outcomes, as previous research has elaborated upon. Even a slight improvement in efficiency, diagnostic accuracy, and/or adherence from improved communication and negotiation could greatly affect outcomes, satisfaction, and cost. It is in these ways that we hope our course idea will contribute to the wellbeing of patients and society.

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Struggle with School Absenteeism in Compulsory Education: Different Country Approaches and Policies

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Abstract This research has been conducted to discuss the absenteeism in compulsory education and the proposed policies for reducing this problem with the school practices. In this context, the general situation regarding the absenteeism in the Turkish education system has been put forward and the current practices and policies have been addressed. Furthermore, in other countries, the current situation and practices of non-attendance in the compulsory education process and what can be done are discussed. This research is a qualitative research and case study designed. In the research, data were collected via literature research. During the collection of data; in addition to the literature on absenteeism in our country, it has been also benefited from the publications of the education ministries of the countries and other academic documents in order to see how is address internationally. In this context, the approaches and strategies that are generally followed by countries are investigated by looking at the absenteeism processes of the countries. In particular, referring to example approaches and policies incentives and support mechanisms are described. In this context, the main approaches are; legal regulations, in-school practices, computer technology and family-supported practices.

Keywords Absenteeism, Causes of Absenteeism, Encouragement

1. Introduction

In generally, it is defined as absenteeism from school without any valid excuses (Stoll, 1990). From the literature view, there are several definitions of absenteeism that they do not make much difference. Absenteeism is also referred to as the absence of schooling, with or without a valid reason (Kearney, 2008). According to Altınkurt (2008), absenteeism is defined as a behavior of a student who may be dependent or external to himself / herself and is thought to negatively affect the academic success of the student. According to Turkey Ministry of Education (MoNE) 2015-2019 Strategic Plan, absenteeism is defined as the absence of schooling, with or without a valid reason (MoNE, 2015a).

Absenteeism and truancy are are used interchangeably. But in fact they have different meanings. Truancy is used when students deliberately stay away from school without permission. Truancy is known amongst other things as 'skipping off', 'mitching', 'dodging', 'skiving', 'bunking-off' and 'going missing' (Reid, 2000). On the other hand absenteeism is a more general concept that means regular absence from work or school without a good reason. In this study, the expression of absenteeism is defined in this way.

There are various reasons for student absenteeism. In general, multiple factors play a role in the emergence and maintenance of absenteeism. These factors are; the lack of community support, school environment, the presence of various problems in family life, the inconvenience of school transportation, the emergence of health problems, bad weather and individual factors (Teasley, 2004). Despite similar results in the general research on student absences, there are some changes depending on factors such as culture, education level, legal requirements. Shute and Cooper (2015) point out that family and home environment, student and school give rise to school absenteeism. Similar results were obtained in the research conducted by Öztekin (2013) and the reasons of absenteeism were handled in seven dimensions as student-originated, family-based, teacher-originated, school and school-based, health-related, friend-environment and environment-based. In accordance with researches, in generaally, the causes are generally grouped in seven groups as social factors, economic factors, family factors, environmental factors, psychological factors, school-based factors and personal factors (Reid, 2014).

In addition to academic success, students who have problems with absenteeism face many problems. When the absenteeism becomes a habit, it also brings out the consequences of going out of formal education or early

school leaving. And also, in the long term, it may leads to inability to find work, loneliness and social problems (Rivers, 2010). Moreover, it is known that there is a positive relationship between absence and harmful habits, crime processing and violence (Henry, 2007).

Absenteeism can negatively affect sustainable development. Especially in our country which has a young population, the problems associated with absenteeism are felt more clearly. For this reason, the process about school attendance is a problem that needs to be resolved in Turkey. It is thought that the researches aiming to produce solutions for the problem of student absenteeism can contribute indirectly to the social development and development as well as the direct contributions to the education system in the first place. However, when researches on the subject at the national level are examined, it is seen that the studies are mostly focused on the reasons for absenteeism (Education Reform Initiative, 2015; Özbaş, 2010). For this reason, the approaches and practices that have been considered in reducing the absence of absenteeism in the research rather than the causes of absenteeism. Along with the process in Turkey, different approaches and policies of different countries have been mentioned. For all these reasons, in the research, it has been aimed to research different struggle methods and strategies that applied to school absenteeism for compulsory education in Turkey and other countries. In line with the general objective, the following questions are tried to be solved.

(1) What is the current legislation for absenteeism in Turkey?
(2) What is the current legislation for absenteeism in different countries?
(3) What are the approaches and policies about absenteeism in different countries?
(4) What are the suggestions for struggle with school absenteeism?

2. Method

The study aims to present the present situation in Turkey and in some other countries in a comparative way based on legislative documents and regulations. The study was carried out using qualitative research method in accordance with case study design. Qualitative research method, aiming to make an in-depth examination of a phenomenon within its own reality, was considered more appropriate for the present study. Situations are limited to time and action, and researchers collect detailed information using a variety of data collection methods over a long period of time (Creswell, 2014; Büyüköztürk ve diğ., 2013). Literature research was used as data collection tool.

3. Situation of Countries for Compulsory Education

Compulsory education means that all individuals who have entered the age of education in a country are subjected to the process of being in a similar schooling with the content and duration of legal arrangements. In conclusion, it means legally-required period of time that children are expected to attend school.

Nowadays, almost all modern education systems are regulated by national law legislation; and it has compulsory education changing with time and scope. Thanks to compulsory education, every individual in the society is equipped with the knowledge and skills that are thought to be necessary for adapting to the structure of modern society; the rules of behavior that must be complied with. And also individuals learn the rules of behavior, rights, duties and responsibilities that must be followed (Akçabay, 2012).

In Turkey, with "the Primary Education and Training Law no 6287" adopted on March 30, 2012 also called as 4+4+4 system, compulsory education was increased to 12 years, and the secondary education was taken into the scope of compulsory education. Within the scope of this reform, the duration of compulsory education, the names and the duration of the school grades have been changed, the transition between grades has been arranged, new elective courses have been set up. However, as in many countries, in Turkey, there are many students who cannot attend regular training for various reasons during when schools are open to education (Önder, 2017).

According to UNESCO data, compulsory education periods vary between 4 and 13 years. The duration of compulsory education is between 4-6 years in 51 of the 192 countries, 7-9 years in 86 countries, and 10-13 years in 59 countries. There is one country where the duration of compulsory education 4 years and there are 10 countries where it lasts 5 years. In this context, the shortest times (average 6 years) are seen in African and Asian countries, the longest times (10 years and over), North America, Europe and Central Asia. On the other hand, when age limits (starting and leaving ages) associated with compulsory education are examined, it is observed that the age limits on the global scale vary between 4 and 18 years (Eurydice, 2015; MoNE, 2015b).

The length of compulsory education in the United States differs from state to state. Compulsory education in general, together with the difference, includes the education of children in the 6-16 age group. Considering the applications for the duration of compulsory education, There are four alternatives in the form of 6 + 6; 6 + 3 + 3; 4 + 4 + 4; 8 + 4 (Demirtas, 2011).

4. Strategies for Struggle with School Absenteeism

There are a variety of strategies and practices to struggle with school absenteeism. It may not be right to intervene at a point as there is no single cause of absenteeism. In general, the development of a national absenteeism intervention tool,

the development of an early warning system, the arrangement of educational environments according to the needs of the students, the implementation of deterrent sanctions and the development of school-family relations are the regulations works that can be done to struggle with school absenteeism (Ahmad ve Miller, 2015).

In the 2015-2018 Strategic Plan, the Ministry of National Education outlined the concept of absenteeism and set various strategies for this issue. When the plan is considered, 34.8% of student had absenteeism over 20 days in 2014. It is seen that the rate of 25.3% in primary and secondary schools aims to decrease to 10% and in secondary education it is 38.9% to 20% (MEB, 2015). In addition, the following strategies have been identified on the plan.

- Investigations will be conducted to determine the reasons for absenteeism, grade repetition and early school leaving in all school types and grades.
- "Secondary Education Orientation Program" will be generalized in order to reduce absenteeism, class repetition and school dropout in secondary education.
- Mechanisms for monitoring and preventing student absenteeism will be developed to prevent early school leaving from compulsory education and to reduce school absenteeism.

The Ministry of National Education is carrying out various projects and studies to reduce the increasing absenteeism rates. The Directorate General for Basic Education has done a project on increasing the Attendance Rates to Primary Education Institutions in order to increase the attendance rates in primary education including the first eight years of twelve years of compulsory education. Project was carried out between October 2013 and October 2015 and the activities were in a total of 120 pilot schools in 12 provinces (Agri, Van, Mus, Diyarbakir, Bitlis, Bingöl, Batman, Şanlıurfa, Şırnak, Hakkari, Mardin, Siirt).

The General Directorate of Secondary Education have done the project on the Development and Implementation of the Intervention Model to prevent interventions for students at risk of dropping out of school at secondary level and to ensure that those who had left school were able to acquire some skills by being brought to school outside of class hours. Within the scope of the project, a training program was prepared and put into practice. It is also important to prevent absenteeism in the project.

One of the objectives of the Secondary Education Orientation Project conducted by the General Directorate of Secondary Education on the average of the number of days absent from the 9th grade in Turkey is to lower the absenteeism rates. The Secondary Education Orientation Program prepared for this purpose has been implemented in the pilot provinces and it has been decided to spread it after successful results have been obtained. It is expected that the secondary school adjustment program will be generalized to all schools at the secondary level.

General Directorate of Vocational and Technical Education have done the projects named School Attendance Rates Especially for Girls (KEP-1) and KEP-2 in order to increase school attendance rates at primary and secondary school levels, to increase their professional skills and competencies, and to raise awareness among parents about the importance of education for their families. And also initiated a study to investigate the causes of the absenteeism, grade repetition and drop out.

From the point of view of different country practices, it is seen that different strategies have been applied in struggle with school absenteeism. For example, since 1986 in the United States, the National Center for School Engagement has been conducting researches. In the context of the studies, the task of reducing the school dropout rate of the United States is carried out on the students who are at risk inclusive disabled students. In this context, the use of some effective strategies has come to the forefront. These strategies are generally divided into four categories: School and community-based practices, early interventions, core strategies and benefit from education mostly (Smink ve Reimer, 2005).

The policy document issued by the Australian Queensland Government Education Department also highlighted the five main strategies that could be carried out for students to attend the school. These are; create a positive school culture, communicate high expectations of attendance (school website, newsletters and registration package), record and follow up various statistics (Queensland Government Education Department, Training and Employment, 2015).

In the studies conducted by Hanover Research (2016), research-based strategies for absenteeism at secondary and high school levels and three school districts that were successful in improving their participation were investigated. In this context, the strategies are forward:

- Understanding the causes and effects of absenteeism has crucial importance in the design of strategies and programs that target the attendance of students.
- A collaborative approach is required.
- Individual support strategies, including counseling and graduation coaches, can help encourage attendance schooling and participation.
- Smaller learning communities offer a more flexible, personalized and responsive environment that contributes to increased student participation and academic success.
- Impressive and meaningful instruction also encourages students to continue at secondary school level.

Strategies for absenteeism are also mentioned in a document issued by the Australian Ministry of Education. The main strategies for documenting the situation, information, monitoring, rewards / incentives and other elements are mentioned. Rewards and incentives are (Victoria State Government Education and Training Department, 2017):

- Providing a term award, for example a sausage sizzle or extra sports activity, for all students who have attended every day.

- Presenting weekly 'class on-time' awards at assembly.
- Providing a special excursion once a year for the top 20 per cent of attendees for the year.
- Introducing attendance prizes each term, for example basketballs, footballs and tennis racquets, for 100 per cent attendance for the term and a smaller prize (cinema ticket) for 90 per cent or greater attendance.
- Issuing raffle tickets to students with good attendance. At the end of each week, the raffle for a showbag is drawn.
- Organizing a friendly competition between rooms or sections of the school based on attendance for the term, for example having a free BBQ sausage sizzle lunch for the 'winning' group.
- Introducing attendance prizes each month (certificates and some fun stationery) that are awarded for full attendance.
- Sending reminders to students at the end of each school day about the exciting things they can expect to happen at school the following day.

The policy document issued by the Government of Wales also includes suggestions and practices on student attendance. In this context, the use of prizes and incentives to encourage participation and punctuality has been mentioned. It is also emphasized that the awards have a more motivating role than punishment (Welsh Government, 2011).

A three-tiered structure for attendance and participation has been adopted, and appropriate strategies have been indicated, with a published report on British school districts in Priority Early Outreach for Positive Linkages and Engagement (PEOPLE) (Vaverchak, J. and Harris, S., 2014). That means;

- Priority: Focuses on at-risk students in grades, schools and neighborhoods with high levels of chronic absence
- Early: Begins with the start of school.
- Outreach: Connects to students and families
- Positive: Promotes preventive, supportive approaches rather than punitive responses
- Linkages: Taps the full community for support
- Engagement: Motivates showing up to class & offers students & families a role in improving attendance.
- Figure 1 shows that people helps ensure adoption on a tiered approach that begins with prevention.

Along with the policies and approaches carried out in Turkey and other countries, it is understood that absenteeism struggle programs is generally considered in four groups in the literature (Gullatt ve LeMoine, 1997). The first group consists of legal regulations used to prevent absenteeism by public and state entrepreneurs. The second group includes in-school practices used by school administrators. The third group focuses on the use of computer technology to combat absenteeism. The fourth group consists of family support programs.

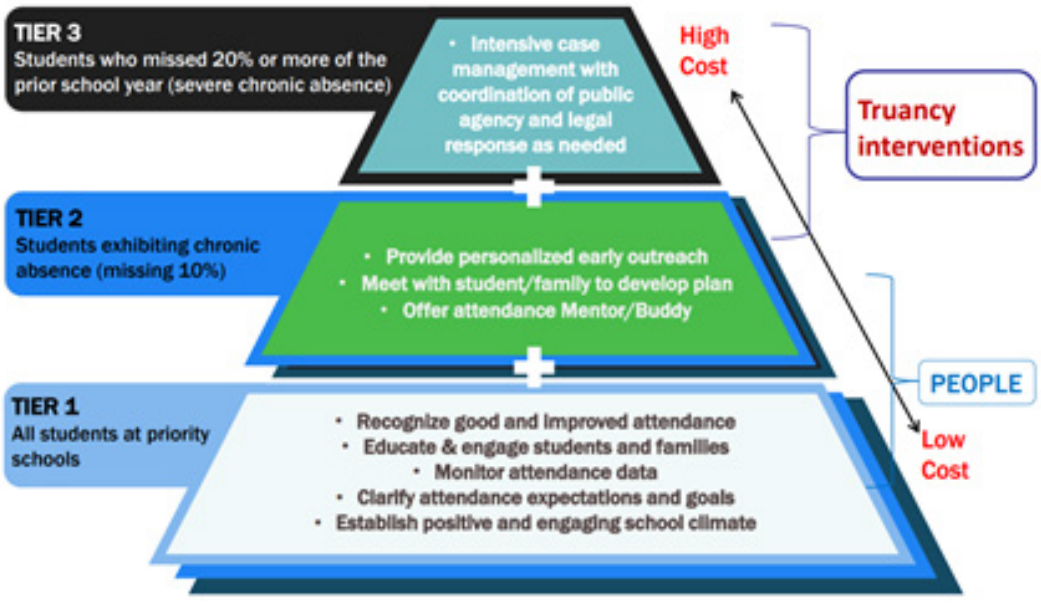

Figure 1. Three-tiered structure about attendance school in the UK

4.1. Legal Regulations

In Turkey with the Law No. 4306 in 1997, eight year uninterrupted compulsory primary education was introduced. Compulsory education has been increased to the 12th year with the "Law on Primary Education and Education No. 6287" which is also referred to as the 4 + 4 + 4 system accepted on March 30, 2012 and secondary education has been included in compulsory education.

According to the regulation of the Ministry of National Education (MoNE) Preschool Education and Primary Education Institutions, grade repetition is not used for primary school students. In relation to absenteeism, "the child who has not continued schooling for 10 days without any valid reason" is warned with the letter by the school director. Despite this warning, the register isdeleted for children who do not continue school for 30 days. In the middle school, the border situation regarding absenteeism is stated as 20 days without excuse.

According to the Basic Law of National Education, secondary education is obligatory. The absenteeism limit that students can make during the course of the year and the methods to be applied when they do not comply with this period are determined by the Ministry of National Education Regulation for Secondary Education Institutions. According to the Regulation, students who exceed 10 days with excuse and total 30 days without any valid will be considered unsuccessful regardless of their course scores. But this period is 60 days with the health report (MoNE, 2013).

The number of absences of the student (with excuse or without excuse) is a valid reason for grade repetition in some countries including Italy, Cyprus, Hungary, Poland, Portugal and Romania. In each of these countries, the limit on the number of absences has been determined. If this number is exceeded, student can't be succesful to go to next grade.

In Italy, if a participation rate is less than 75% during the entire training period, the student may need to repeat the class. In Cyprus, a student can take a class offense if there is no valid reason 51 or if there is a 161 absenteeism regardless of whether there is a valid reason. In Hungary, it is not possible for a teacher to assess a student at the end of a school year if the total number of absences of the pupil in a school year exceeds 250 class hours, or if the student misses more than 30% of lessons. In Portugal, the total annual amount of invalid absenteeism at secondary level must not exceed three times the amount of weekly instruction per course. In Romania and Poland, if the number of absences of students is more than 50% of the total number of courses, a grade repetition might be required (Eurydice, 2011).

One of the methods of preventing the absence of legal regulation is the family sanctions. In some states of the United States, the parents of students who are absent are obliged to cooperate with the school. Parents who do not attend the interviews that the teacher has determined are subject to fines (Gullatt ve LeMoine, 1997). Another practice related to absenteeism is the zero tolerance policy. In this practice, schools do not accept any excuse for their students other than their approved paper from health institutions. Low scores are given students who absent without a valid excuse. In some schools this practice is done for a maximum of 10 days, including a medical excuse (Bishop, 1989).

Another method that has been tried to prevent absences is that students have to come to school on weekdays and take remedial training based on the lesson hours they are absent. Students who cannot successfully complete remedial training will receive remedial training the following week. Students who are absent for 10 days are considered to be unsuccessful for that grade (Kube and Ratigan, 1992). In England, students who are absent without excuses are given fines. The monetary penalty can be given by the police, the local forces or the school head (BBC News, 2015).

4.2. In-school Practices

One of the efforts to prevent absence is to provide in-school communication. Research shows that communication between teacher and student has a significant effect on absenteeism (Testerman, 1996). It is important to provide continuous feedback to students who are absent and discuss the solution (Zhang, Katsiyannis, Barrett and Willson, 2007). In addition, it is considered that if the physical environment of the school meets the needs of the student, the loyalty of the student to the school will increase and this commitment will decrease the numbers of school absenteeism. Social activities at school also have important effects on absenteeism (Gömleksiz and Özdaş, 2013).

In research conducted by Hannover Research (2016), research-based strategies for attendance at secondary and high school levels has been researched. Three successful school districts have been dealt with in this direction. The study also included exemplary incentives to be offered by teachers and school administrations. Table 1 presents some incentives that can be appropriate in the secondary setting (Hanover Research, 2016).

Table 1. Incentives Offered in Secondary Schools

Teachers Can Offer	Administration Can Offer
• Positive comments to students • Positive phone calls or notes to parents • Free homework pass • School supplies • Certificates for the best record or most improved attendance record	• Recognition during announcements • Award at student assembly • Breakfast/lunch with administrators or school board member • Food coupons redeemable in school cafeteria • Pizza party for the class/ team with the best attendance • "School money" for the school store • Choice of donated product (movie, tickets, gift card) Parking space near building for student with most improved attendance

Georgia middle school, which takes advantage of in-school strategies to avoid absence, detects attendance on a weekly, monthly and semester basis. Each class rewards classroom lessons with milk and buns, which is the best participation on a monthly basis. In the high school, there are difficulties for absent students. Seven unexcused absences mean failure. However, students in high school has incentives. Students who have fewer two absences can earn extra 10 points in their final exams (Hanover Research, 2016).

A documentary published by the Government of Wales has included suggestions and practices on attendance of the students. In an exemplary application (participation tree project), gold was given to students who continued 100%, silver to students who continued 98%, and bronze leaves to students who continued 95%. At the end of each semester, each student wins his or her leaf and is rewarded with a certificate by the school council, which leads to 95% attendance (Welsh Government, 2011).

Another documentary issued by the Queensland Government of Australia provides a concrete applications to promote attendance. Attendance thresholds and targets for individual students were set at some schools visited (Queensland Government Department of Education, Training and Employment, 2012). These are set out in Table 2.

A report on absenteeism issued by the New Scotland, Canada Education and Early Childhood Development Department also mentions that some schools provide incentives to improve attendance, including student recognition, classroom awards and exemption from exams when grades and attendance are high (Nova Scotia Education and Early Childhood Development, 2016)

A report on absenteeism issued by the Los Angeles Education Department has emphasized the various activities to reduce absenteeism. The reward system for participation is also mentioned in this context. It has been emphasized that each school should have a system to award participation. At primary school level, students are recognized in the parliaments and assistant principals, counselors and teachers are individually awarded and congratulated students at the high school level where the certificates are issued. It also provides rewards for excellent participation by announcing for every student on the school website (Los Angeles County Education Coordinating Council, 2012).

4.3. Computer Technology

The first step in controlling absenteeism is to establish an effective monitoring and evaluation system. This system, which will be created with the aid of a computer, will be able to intervene immediately and develop solutions for absenteeism (Shute and Cooper, 2015). Another important technological development to avoid absenteeism is seen as mobile phones. Thanks to the mobile phone, information about absenteeism can be communicated to the parents instantly and the attendance of the student can be ensured.

In 2007, the Ministry of National Education established e-School System and e-School Parent Information System. Prior to 2007, there was no centralized absence of attendance. Schools have kept absenteeism records by recording them in a notebook. If centralized data were needed, data was collected from the schools by official letter. With the passing of the e-School System in 2007, absenteeism started to be monitored with a central monitoring and evaluation system.

The E-School Parent Information System gives parents and students the opportunity to access information on absenteeism. Parents or students can enter the system with their own personal information and control their knowledge. In addition, a text message is sent to the parents via 8383 short message service which is established as an integrated e-School System. The parent can be informed on the same day that the student is absent. According to the Regulation on the Secondary Education Institutions of the Ministry of National Education, it is obligatory to inform parents about absenteeism by post in certain periods, on the 5th, 15th and 25th days of the absence (MoNE, 2013).

With the "No Child Left Behind" project started in 2001 in America, all education regions regularly keep the data on absenteeism and send them to regional agencies. This is expected to lead to joint steps to combat absenteeism in the states and the states (Promote Prevent, 2012).

Table 2. Attendance thresholds and targets in schools

School	Threshold / Target	Action
Cairns West State School	Over 95% attendance	Student rewarded in assembly
Mabel Park State School	100% attendance	Student receives a letter home (at the end of term) and an invitation to a celebration morning tea
	Between 75% and 90% attendance	Teacher to follow up reason for absence.
	Under 75% attendance	Student referred to welfare officer
Mabel Park State High School	Over 95% attendance	Student receives 'positive attendance' letter and may access extra privilege reward activities
	Between 80% and 90% attendance	Continue to monitor student's attendance
	Under 80% attendance	Deputy Principal to investigate and refer student for case management where needed

4.4. Family Support

The family is known to have a significant effect on student absenteeism. In this context, it has been observed that if the parents communicate well with their children and deal with their problems, the absenteeismm of the students decreases (Pehlivan, 2006). The basic role of parents in the struggle with absenteeism is to provide a good family environment and family communication for their children. Research conducted in general assigns importance to the education of parents' children in all social levels (Levin, Belfield, Muennig and Rouse, 2007).

Communication between school and family has an important for fight against absenteeism. Families with poor communication with the school have no influence on the absences of their children and do not take responsibility for it. The method that can be applied in this regard may be to implement compulsory family education to improve school-family communication. Parents who are students with a high degree of absenteeism may be forced to take part in the school trainings to ensure that their parents take responsibility for absenteeism (Reid, 2010).

Cairns West State School in Queensland has implemented the Academic Success Guarantee program to improve student participation. The program involves a service agreement between the school and parents. The school provides a commitment to work with students to reach academic benchmarks in a 'whatever it takes' culture for students who attend at least 95 per cent of the time. The agreement is signed between the school and interested parents. The key messages the program seeks to communicate are (Queensland Government Department of Education, Training and Employment, 2012).

- for parents: If you want your child to be successful, send them to school.
- for teaching staff (teachers and teacher aides): If kids come to school then we must do whatever it takes to ensure success.
- for administration staff: Supporting teachers, parents and kids by doing whatever it takes to ensure success.

The City Attorney's Truancy Prevention Program has educated over 250,000 families about the importance of attending school. The program's letters have directed over 70,000 families to general assemblies where families are taught the legal and practical consequences of truancy. Additionally, almost 4,000 families have been referred to City Attorney Hearings for one-on-one intervention. From these families, counselors have taken over 200 to SARBs and have referred 70 families for court intervention that includes diversion in lieu of prosecution (Los Angeles County Education Coordinating Council, 2012).

Conclusion and Suggestions

In this study, the effects of the strategies and methods of struggle against absenteeism in the compulsory education process are discussed. It is seen that the compulsory education of the countries mostly covers the period after the pre-school and before the higher education level. There has been some methos an most importants of them are legislative arrangements, in-school practices, computer technology and family-supported methods. In Turkey, more legal processes and computer-assisted intervention strategies are in the foreground. And also rewards and incentives has been emphasized. There is a need for more comprehensive and more cooperative policies to reduce absenteeism. Following the results of the survey, the following suggestions were made for the process in Turkey.

- Social activities (excursions, picnics, etc.) for students who regularly attend the school (eg 90% attendance) can be arranged.
- Students who are regularly participating in the recruitment of the arrow can be awarded (eg, basketball on the spot, tickets for matches of volleyball teams).
- Various gifts (eg books, developer mind games) can be given to students who regularly participate in the school
- A student with a monthly number of days without absenteeism can be congratulated at the Flag Ceremony.
- Aletter of congratulation can be written to the parents and invited to the school due to regular absence.
- Cinema can be watched or allowed to perform sporting activities within the course hours to the classroom with the highest attendance rate in the school.
- Legal processes about absenteeism can be informed so that parents are informed about the possible consequences of absenteeism, like class repetition, reduced course success, reduced commitment to the school, etc. At the end of this process, a protocol document between the school and the parent can be signed.
- The development of physical and social facilities (such as sports halls, libraries, cafeterias, school halls, etc.) in the school can be improved so that students can have more time in school.
- School administration can develop business associations by engaging in stronger communication with families to prevent absenteeism.

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