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Editorial

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IS CRUCIAL,

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Analysis of Primary School Teachers' Knowledge of Geometry

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Abstract

This study investigated the geometry knowledge of in-service primary school teachers through measuring both their content knowledge (CK) and pedagogical content knowledge (PCK) using a descriptive and qualitative approach. The participants of the study were 23 primary school teachers who work in public schools with teaching experience that ranges from six months to 30 years. The teachers voluntarily attended a teacher-training seminar conducted by the researchers and completed a test, which included open-ended questions. This particular study presented here is part of a larger design-based research project on a seminar that trains primary teachers to teach mathematics. The collected data were analysed through qualitative data analysis techniques with a holistic approach and discussion. The findings are presented according to the three geometric concepts that the study focused on: quadrilaterals, angle measurement and transformation geometry. On the whole, the study found that the CK of the primary school teachers was weak. We also found that the teachers' PCK was weaker than their CK due to the relationship between CK and PCK. Hence, primary school teachers should be offered additional teacher training sessions for the purpose of improving both CK and PCK, which will, in turn, enhance the learning opportunities of their students.

Keywords: Geometry Knowledge, Content Knowledge (CK), In-Service Primary School Teachers, Mathematics Teaching, Pedagogical Content Knowledge (PCK).

Introduction

Students are typically exposed to fundamental mathematical concepts for the first time during their primary level of education. The learning opportunities of students are directly related to the knowledge of their teachers, including primary school teachers. For this reason, it is worth analysing the knowledge that primary school teachers are required to have to effectively teach mathematics. Content knowledge (CK) and pedagogical content knowledge (PCK) are the two knowledge dimensions which are highly related with each other and have an impact on students' learning and motivation (Kleickmann et al., 2013; Krauss et al., 2008).

Recent research indicates that primary school teachers, as well as pre-service teachers, have weak knowledge of CK and PCK (Venkat & Spaull, 2015; Turnuklu & Yesildere, 2007) regarding the teaching of geometry (Jones et al., 2002; Hourigan & Leavy, 2017; Fujita & Jones, 2006; Jones & Tzekaki, 2016) in different contexts such as quadrilaterals, geometric thinking, or spatial reasoning/ability. Although there are studies on the knowledge needed to teach geometry, many of them include pre-service primary teachers or they define the primary level of education as the first eight years of learning and include a broad range of K-8 (Browning et al., 2014). The shortcomings of these studies have led us to focus more specifically on the CK and PCK of in-service primary school teachers in teaching geometry. Therefore, the CK highlighted in this study refers to geometry content knowledge or the knowledge that teachers will use in the teaching of geometry. Jones (2002) describes teaching geometry as knowing how to recognize interesting geometric problems and theorems, valuing the historical and cultural context in which they are taught, and understanding the many different ways in which geometry can be integrated (p. 122). PCK refers to knowing how to transfer this professional knowledge to students. Geometry CK should be evaluated within the CK that teachers should have in order to teach mathematics more broadly. Studies show that the CK of teachers and/or prospective teachers is lower in geometry content than in other subjects (Marchis, 2012; Tsang & Rowland, 2005). Moreover, there are studies which examine the relationship between teachers' knowledge of geometry and the way in which students learn (Unal et al., 2009). That is, the geometric thinking skills that students are expected to acquire are a function of how the teachers themselves develop their own knowledge of geometry. What teachers teach and how they transfer that knowledge to their students directly affects student learning comprehension. The intention of our study is to describe the CK and PCK needs of in-service primary teachers in order to teach geometry, contributing to a gap in the literature on in-service primary teachers. The primary teachers of this study are those responsible for the first four years of primary education in Turkey.

The skills expected from students such as critical thinking, intuitive decision-making, problem solving and logical reasoning, which are all key components of the current national mathematics curriculum, can be developed through geometry teaching. It is thus critical to examine the geometry knowledge of teachers (Ministry of National Education [MoNE], 2018). Being closely associated with mathematical concepts, possessing intuitive, visual and aesthetic features, and bringing creativity to the forefront are all inherent in the geometry. For this reason, teaching geometry requires a special effort At the same time, it is important to investigate teachers' ability to teach geometry (Jones, 2002). With the development of information technologies and the emergence of new uses of geometry, ranging from animation to global positioning systems, teaching geometry is particularly rele-

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vant today. The aim of this study is to describe and investigate the geometry knowledge of in-service primary school teachers in terms of their CK and PCK. For this purpose, the following research questions were asked:

1. How could the knowledge of in-service primary school teachers need to teach geometry be described, in terms of both CK and PCK?

2. How could the CK and PCK needed by in-service primary school teachers to teach geometry be intertwined?

Literature Review

For decades, researchers have been interested in understanding what teachers need to know for the teaching of mathematics, and this knowledge package required to teach mathematics continues to evolve. Shulman's (1987) idea of the fundamental level of knowledge needed for teaching began to develop with the definition of PCK. This conceptual expansion could be seen in one of the widely accepted knowledge packages presented as knowledge needed to teach mathematics by Hill et al. (2008). In response to Shulman's introduction of PCK, various knowledge packages were proposed, with one of the most popular presenting the knowledge needed for teaching mathematics as a combination of knowledge types in different dimensions (Ball et al., 2008). The knowledge package presented by Hill et al. (2008) is depicted in Figure 1 below:

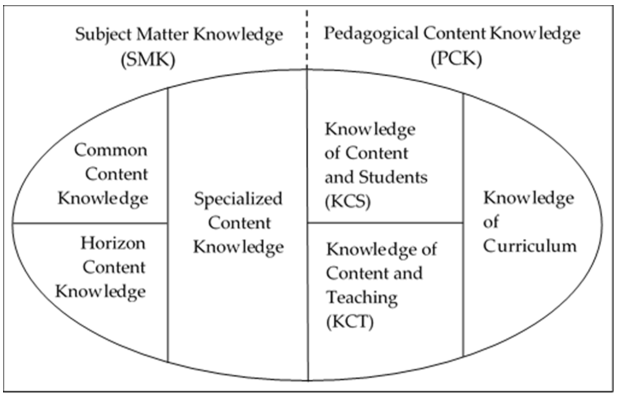


Figure 1. The Required Knowledge Package for Teaching Mathematics (Hill et al., 2008)

Researchers argued that teachers should have advanced PCK. Superior knowledge of content alone is necessary but insufficient to teach mathematics. What is also needed is an understanding of how to apply knowledge of the subject matter when teaching mathematics (Ball et al., 2008; Hill et al., 2008). CK or subject matter knowledge can be defined as the professional knowledge required in a specific subject (Ball et al., 2008). As seen above, CK is composed of three categories: common content knowledge (CCK), which is general mathematical understanding in a non-teaching context; specialized content knowledge (SCK) which is the knowledge specifically needed to teach mathematics; and horizon knowledge, which refers to the ability to understand the relationships between different mathematical concepts throughout the mathematics curriculum (Ball et al., 2008). SCK is prominent in the practice of teaching as a profession; knowing a subject not only requires having knowledge of the truths or concepts about a particular subject, but also refers to being able to identify and explain the relationships between concepts (Hill et al., 2004; Ball et al., 2005). The researchers further characterized PCK in terms of knowledge of content and students (KCS) and knowledge of content and teaching (KCT) (Ball et al., 2008). While the KCS dimension is defined as the ability to modify teaching by taking into account both students and mathematics, the KCT dimension refers to the ability to adjust teaching according to both the method of instruction and mathematics.

The knowledge required to teach mathematics has also been researched in different contexts related to problem solving, to validating the knowledge dimensions and to revealing the relationships between the knowledge dimensions (Chapman, 2015; Knievel et al., 2015; Hoover et al., 2016; Charalambous, 2016). In teacher knowledge frameworks utilizing PCK, as well as in the Technological Pedagogical Content Knowledge (TPACK) framework, various studies have investigated the relationship between the CK and PCK knowledge dimensions (Kleickmann et al., 2013; Krauss et al., 2008).

In the case of research on primary school teachers, there are studies which have reported a low level of mathematics subject matter knowledge, although only a few specifically investigated CK for teaching geometry (Hourigan & Leavy, 2017; Jones & Tzekaki, 2016). Jones et al. (2002) state that pre-service teachers assume geometry to be the least prioritized subject within the mathematics curriculum. An analysis of the geometry domain in the Turkish primary school mathematics curriculum reveals four different sub-domains: geometric shapes and solids; spatial relationships (congruent things, symmetry, symmetry line and reflection symmetry); geometric patterns (patterns including shapes, and tessellations with two-three different shapes); and fundamental concepts in geometry (point, line, line segment, half-line, plane, angle, acute angle, obtuse angle, right angle, and straight angle) (MoNE, 2018). Primary school teachers are responsible for teaching these geometry concepts to students from grade one to four.

A review of the related literature finds that many of the studies focus on the geometric thinking skills and levels of teachers and prospective teachers, with a majority of the studies conducted with prospective teachers. Some of these studies are quantitative, examining the participants' geometric thinking skills with other variables such as gender or spatial ability (Turgut & Yılmaz, 2012). Other research focuses on related concepts within the framework of geometric thinking, for example, geometric transformations or transformational geometry (Yanık, 2011), or examines them in a more specific context, including geometric discourse (Wang & Kinzel, 2014) and geometric habits of mind (Köse & Tanışlı, 2014). Wang and Kinzel (2014) examined the parallelogram knowledge of prospective primary and elementary school mathematics teachers. The participants were asked to classify a group of geometric shapes (quadrilaterals), and then researchers evaluated their understanding of the characteristics of the parallelogram. The findings of the study indicate that, although the prospective teachers were at the same van Hiele geometric level, participants show that they could have a different geometric discourse but they were weak in justification and definition (Wang & Kinzel, 2014). In another study conducted specifically on geometric shapes and their characteristics, van Hiele geometric thinking levels of prospective primary school teachers were evaluated through a knowledge test (Žilková, Gunčaga & Kopáčová, 2015). Focusing on the ability to recognize two-dimensional shapes and questioning the basic features of the shapes, the researchers found that the participants' geometric thinking levels were quite low and that they were less successful in answering questions about the parallelogram than the other quadrilaterals.

A study conducted by Aslan-Tutak and Adams (2015) aimed to improve the CK of geometry of 102 prospective primary school teachers. As a result of activities incorporated into the pre-service teachers' mathematics teaching methods course, there was a significant difference in the development of pre-service teachers' geometry CK. Furthermore, the participants in the study were aware of the deficiencies in their geometry CK and the researchers claimed that they were not yet ready to teach geometry. In another study conducted by Toluk-Uçar (2011) that sought to determine the PCK of prospective primary school teachers and mathematics teachers, the teachers were asked to make instructional explanations on various subjects including geometry. The research concluded that the teacher

candidates' answers to the questions were largely based on memorization and that they were unable to make instructional explanations of the subject.

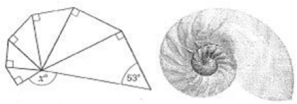
Methodology

This study is a small part of a design-based research project which explores the design process of an in-service teacher training seminar that develops primary school teachers' CK and PCK needed to teach mathematics. The seminar was announced to all teachers throughout the province with the cooperation of the provincial directorate of national education and a teacher institution founded in the university for teachers. A total of 23 teachers, made up of eight men and 15 women, volunteered to attend the seminar. A majority of the teachers, 17, have 10 to 20 years of teaching experience. While a newly appointed teacher with the least experience had been teaching for only six months, the participant with the greatest experience had been teaching for 30 years. Seven of the participants had graduated from faculties other than the department of primary school teaching, including biology teaching, physics, and geophysical engineering, among others.

At the beginning of the seminar, the teachers were examined in a test which took approximately 40-50 minutes, consisting of 19 questions assessing mathematics CK and 15 questions assessing PCK. This test is a Turkish version of a multifaceted test used by Callingham et al. (2011) in their studies. This test was chosen because its questions are organized in three separate sections of CK, PCK and beliefs, while including all learning areas in the primary school mathematics curriculum. The CK and PCK sections consist of open-ended and interpretive questions. In our study, the test was translated into the Turkish language in order to evaluate the knowledge needed by primary school teachers to teach mathematics, and was applied to the participants in two separate sections.

The study summarized here encompasses an analysis of geometry-related items in the test. In order to assess the knowledge of geometry of primary school teachers, the responses were examined through qualitative data analysis. Three questions were selected from the CK section and three from the PCK section. Figure 2 below provides an illustration of the exam questions, depicting the shell question as it relates to angle measurement in the CK section.

A model of how a shell grows can be made using enlarged copies of the same triangle. Here is a picture of a model.



	127	138	143	153	222
What is the value of x in degrees?					

Figure 2. A Sample CK Question: The Shell Question and Angle Measurement

Another question in the CK section asks whether a given definition/explanation of basic concepts of transformation geometry, such as translation, congruency, and similarity, is right or wrong. In this question, each alternative was evaluated separately. The last question in the CK section asks whether the given seven quadrilaterals/polygons are parallelograms or not. The answers to this question were evaluated in the same manner as those to the previous question.

In the PCK section, teachers were requested to provide the best possible feedback to a student according to a particular situation. A sample question of this section is provided in Figure 3 below. This question examines the relationship between a square and a rectangle and is analyzed below in the quadrilaterals section on findings. Another question in the PCK section assesses the responses of the teacher to a student's measurement using the protractor and is analyzed below in the angle measurement section on findings. The last PCK question examines how the teacher would explain the relationship between the rhombus and other quadrilaterals.

Ann and Bob are Year Six students completing a task in which they are asked to investigate the areas of rectangles with a perimeter of 24 cm. Ann claims that the maximum area is 36 cm^2, while Bob claims that it is 35 cm^2. Which of the following is the most likely explanation of why one of them is incorrect?

☐ Ann is incorrect because she has not understood the difference between a square and a rectangle.
☐ Ann is incorrect because she has calculated 5.9 by 6.1 and rounded up.
☐ Bob is incorrect because he thinks squares are not rectangles.
☐ Bob is incorrect because he has only used whole numbers instead of decimals.

Figure 3. A Sample PCK Question: The Relationship Between a Square and Rectangle.

The teachers were asked to use the empty spaces in the test paper to show their work while answering the test. Explanations were provided to the participants to the questions they posed regarding aspects of the exam that they did not understand.

The study described here adopts a descriptive approach in terms of its purpose and a qualitative research approach in terms of the inquiry method (Kumar, 2019; Creswell, 2007). Descriptive research collects information for the purpose of systematically defining and describing a situation, a problem, a phenomenon, a seminar or a program. In this study, examining the geometry knowledge of in-service teachers in terms of CK and PCK constitutes a descriptive approach. In the same manner, the systematic analysis of the collected data through qualitative data analysis constitutes a qualitative approach.

Qualitative data analysis was carried out according to a previously prepared rubric by the researchers. For example, in the case of the shell question, there is only one correct response and the participants were evaluated on that basis. The participants' working out of the problems on the test paper and their incorrect responses were analyzed as well. The quadrilateral question has seven options from which to select the correct answer and each alternative was evaluated separately. For the rhombus question, teachers were requested to choose whether the listed feedback should be given, may be given or should not be given. Consequently, the responses of the participants were evaluated as a correct response, partially correct, or wrong. In the overall assessment of each participant, the answer to each question was analyzed separately.

Findings

The presentation of the findings is organized in three sections that correspond to the data analysis: quadrilaterals, angle measurement and transformation geometry.

Quadrilaterals

First, only six of the participants correctly interpreted the relationship between the parallelogram and the other seven shapes of the listed quadrilaterals, one of which was a hexagon. Twelve of the participants claimed that the hexagon and the trapezoid were a parallelogram. The rest of the participants were undecided about whether the square and rectangle were a parallelogram and left the answer blank. Figure 4 below shows the response of one of the participants to this question.

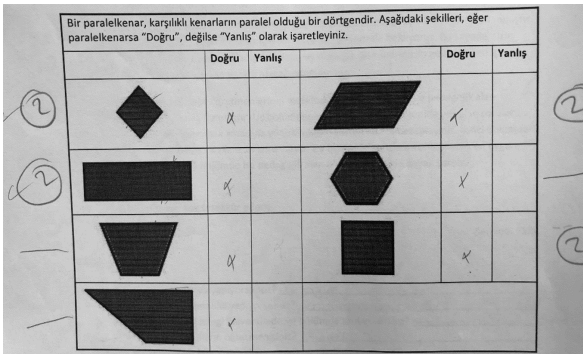


Figure 4. A Test Response to the Quadrilateral Question.

22 of 23 respondents answered at least one option incorrectly or left the answer blank in the rhombus question in the PCK section. Some of the study participants made comments on the exam and selected the options but did not answer correctly. Our interpretation is that the participants are familiar with geometric shapes at a basic level, but lack an understanding of the relationships among the quadrilaterals. Figure 5 below shows one of the responses to this question.

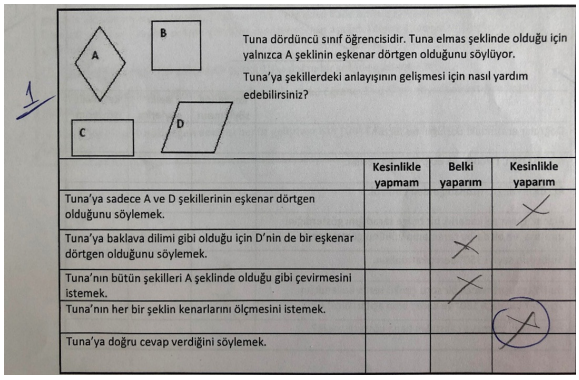


Figure 5. A Test Response to the Rhombus Question.

The other question in the PCK section which examined the relationship between a square and a rectangle is a multiple-choice question and has only one correct answer. 19 of the 23 participants answered this question incorrectly, choosing to give inappropriate feedback to their students. This indicates that they did not understand the relationship between a square and a rectangle.

It is evident that the participants lack general knowledge of the relationships among quadrilaterals. They do not understand what a parallelogram/rhombus is, or how it can be described. That they do not consider that the square is a rectangle also suggests that they lack CK regarding the classification of quadrilaterals. Indeed, the participants' lack of PCK regarding quadrilaterals is directly correlated with their inadequate CK.

Angle Measurement

The angle measurement category contained both a CK and a PCK question. In the shell question assessing CK, a shell model is created by sequentially resizing the same triangle and combining the resulting triangles and asking the measurement of an unknown angle in the model. The teacher is expected to calculate the measure of that angle while showing her progress on the test sheet. Only five of the 23 participants gave the correct answer and nine of the teachers responded incorrectly. All nine teachers who gave the incorrect response did so because of their assumptions regarding the linearity of nonlinear parts. They thought that the unknown angle and the angle that measured 37° degrees were supplementary angles. Figure 6 below shows one of the incorrect responses given in this way.

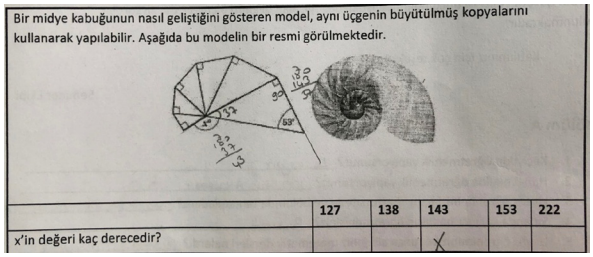


Figure 6. A Test Response to the Shell Question.

For the remaining responses to the shell question, three teachers answered incorrectly because they did not understand the similarity of the polygons. Nevertheless, these three participants all knew that the sum of the interior angles was 180° degrees. All other responses were incorrect either due to the calculations or to the way in which the problem was solved, such as using the exterior angles.

The PCK question in the angle measurement category investigated the possible feedback that a primary school teacher might give to a student while measuring an angle using the protractor. The hypothetical student in the PCK question measured the shown angle as 30°. The question required the participants to determine which of the possible seven feedbacks or reactions they would definitely make, which they might make, and which they would not make. The number of correct responses regarding the appropriate feedback is detailed in Table 1 below.

Table 1. *Participant Responses to the Question of Angle Measurement*

The feedback/reaction	*# of correct responses*
Did you measure the amount of space between the lines?	3
Well done, Kylie, you're absolutely correct.	7
Make sure you line up the protractor correctly.	1
Remember that angles are about the amount of turn, and the arrow shows the direction of turn.	8
You need to subtract that from 360°.	4
This one's tricky because your protractor will only measure angles up to 180°	4
Can you show me which angle you are trying to measure?	11

It is evident that most of the participants did not react appropriately or provide the right feedback to student error, their principal mistake being to guide the pupil to the correct answer and to choose to explain the definition of the concept directly. It was also observed that some teachers made misleading or incomplete directions that were unrelated to the student error.

Transformation Geometry

The only test question in the category of transformation geometry is in the CK section. This question asks the respondents to determine if the five given definitions regarding the

concepts of translation, expansion/scaling and congruency are right or wrong. 17 of the 23 teachers were unable to choose the correct definition of congruency, as follows: "Two shapes are congruent if they differ only in position and orientation in space." We observed that the respondents did not have an understanding of the condition of being congruent of two shapes. The incorrect response, selected by 10 participants, indicated a lack of understanding of the relationship between areas of similar shapes. Nearly half the teachers were unable to respond correctly as to whether an area of a shape will be doubled as a result of enlarging it with a scale factor of two. Another question related to how the edge lengths and therefore circumference of the shape will change when the shape is enlarged with a scale factor of one. Seven teachers were unable to explain the relationship of circumferences to the size of similar shapes. Likewise, seven teachers failed to define translation correctly.

Discussion

This section is organized according to the same structure used in the Findings section. We provide a discussion and interpretation of quadrilaterals, angle measurement and transformation geometry with the relevant conclusions from the related literature.

Quadrilaterals

Regarding quadrilaterals and their properties, it was clear that the participants did not know the basic features of a quadrilateral, for instance, a rhombus or a parallelogram. Although they understood the differences between types of quadrilaterals, they had difficulty in interpreting the similarities and differences. Participants often thought that any shape with two parallel edges was a parallelogram. We also observed that participants did not have an understanding of the concept of a parallelogram, utilizing incorrect definitions. In their study with prospective teachers, Wang and Kinzel (2014) worked with participants in terms of their geometric discourse and found that they had different discourses in defining some concepts such as parallelogram or rectangle. In another study, Marchis (2012) concluded that prospective teachers could not define fundamental geometric shapes because they lacked knowledge of the shapes' basic properties or characteristics. Being able to classify the quadrilaterals but not being able to perceive them in a hierarchical manner can be regarded as a deficiency in CK, which has an effect on PCK as well.

The inadequacy in PCK regarding the rhombus question could be due to the deficiency in CK, given that 14 participants did not recognize that a square is a rhombus. For this question, only one participant selected the correct answer regarding the appropriate feedback to the student. This suggests that there is an obvious relationship between the teachers' CK and PCK regarding quadrilaterals, which was consistent with the findings of Knievel et al. (2014). The researchers further concluded that the lack of CK and PCK in mathematics was the result of a deficient education of primary school teachers who were trained outside the specific field of mathematics teaching or a deficient teacher education period. Being out-of-field, they were not educated to teach mathematics specifically (Knievel et al., 2014).

The responses given to the question regarding the relationship between a square and a rectangle are also indicators of the important deficiencies of the participants in defining quadrilaterals. 13 of the 19 respondents who answered incorrectly claimed that a square was not a rectangle. We concluded that the participants understood quadrilaterals like squares and rectangles only superficially, in addition to being deficient in their ability to interpret their properties or describe the relationship between a square and a rectangle. Hourigan and Leavy (2017) stated that although the participants knew basic theorems and axioms from their teacher education years, they lacked an understanding of the relationships and connections between them. This is due to extensive exam-oriented teaching with significant procedural experience at the university level (Hourigan & Leavy, 2017). This conclusion leads us to another finding consistent with Jones (2002) that prospective primary school teachers perceive geometry as a straightforward subject compared to other learning areas.

Overall, primary school teachers' lack of CK and PCK seemed to be closely connected based on the findings of the study, even though their PCK was considerably less than their CK. Even though the participants in the study had a significant amount of teaching experience, an improvement in PCK depends on having a well-established understanding of geometry concepts and the relationships between them. Having enough CK in and of itself, however is insufficient to guarantee a well-established PCK (Jones, 2002). Studies conducted with prospective primary school teachers concluded that they demonstrated a lack of CK and PCK in nearly all the subjects for which they would be responsible (Turnuklu & Yeşildere, 2007). We assert that when teachers lack CK, they lack PCK as well, and that a well-developed PCK can be achieved through a well-achieved CK.

Angle Measurement

The responses to the angle measurement question related to similar triangles suggest that the majority of the teachers considered the nonlinear line segments as a linear line. This indicates a lack of CK about the concepts of linearity and angle. With only five out of 23 correct responses, we conclude that teachers' CK about angle measurement is incomplete.

Regarding PCK, it was observed that the teachers understood that the answer given by the student was incorrect, and for that reason they hesitated to provide the correct answer. However, many teachers tended to give a direct definition or clue that would lead the student to the answer directly. In addition, some teachers chose to give feedback which was unrelated to the correct answer provided by the student. This situation suggests that teachers had problems in determining which clues and guidance they would give to the student in the case of incorrectly answering a question. It was also concluded that the instructional explanations provided by the teachers to correct student errors were insufficient. The inadequacy of these instructional explanations is due to the lack of both CK and PCK in terms of angle measurement. A recent study shows that teachers have different interpretations about angles and how this mathematical concept was developed. That is, teachers cannot define or explain the angle as a concept (Silfverberg & Joutsenlahti, 2014). Therefore, we conclude that what teachers understand about a mathematical concept affects their use of explanations, feedbacks and definitions which are all in the domain of their PCK. Another study reveals that prospective teachers had deficient geometry CK when they graduated from university and that their methodology courses for mathematics teaching were not sufficient to prepare them for lessons (van der Sandt & Nieuwoudt, 2005). We claim that there are deficiencies in geometry CK of the primary school teachers included in our study and find that this conclusion is consistent with those in the related literature. In summarizing the deficiencies of both in-service or pre-service teachers, Jones and Tzekaki (2016) find that more research should be conducted so as to improve the geometry CK and PCK of teachers.

Transformation Geometry

The few existing studies of teachers' knowledge of transformation geometry suggest that teachers are not ready to teach transformation geometry concepts, as they had diffi-

culties in understanding and explaining the concepts (Gomes, 2011; Köse & Tanışlı, 2014). Köse and Tanışlı (2014) found that pre-service primary school teachers could not explain how a shape dynamically changes after a transformation, such as rotational. This could be understood in the context of the changing nature of geometry teaching from the traditional Euclidean approach toward modern transformation geometry (Jones, 2002). Turkey also experienced this shift in geometry teaching that affected the elementary mathematics curriculum and appeared to be a sub-learning area called transformation geometry in both primary and elementary levels.

Jones and Fujita (2013) addressed congruency with a list of four different concepts, claiming that congruency should be considered a transformation concept. Based on our findings, the participants of the study seemed to lack this understanding of congruency since they could not describe whether shapes were congruent when their position or orientation in space changed. It could further be claimed that the participants were unable to analyze congruency in the case of a transformation, which is a concept that teachers are expected to grasp. Another study concluded that prospective teachers' understandings of translation in terms of motion concepts are weak because they lack the ability to define the translation while relating it with a plane, motion, transformation, or vector (Yanik, 2011).

Conclusions and Implications

Teachers' perceptions of geometry have a direct impact on their way of teaching and on the learning environments they offer to students, affecting their PCK (Aslan-Tutak & Adams, 2015). More research is needed on how to develop improvements in perceptions of teachers and prospective teachers. Teacher education is crucial in this regard; geometry teaching should be carefully considered in the methodology courses offered in teacher education departments.

According to our study's findings, the elementary school teachers had deficiencies in the CK and PCK about basic geometry subjects such as quadrilaterals and their properties, angle measurement and transformation geometry. We determined that teachers were aware of these deficiencies and were willing to attend in-service training and courses in order to overcome their shortcomings. In this respect, we argue that courses and trainings related to geometry teaching should be offered not only to teacher candidates, but also to in-service teachers. A particular emphasis should be made on in-service training seminars for teaching geometry. Prospective teachers should also be supported with activities during their teacher education period (Cantürk-Günhan et al., 2009; Yanik, 2011; Ding et al., 2005). More research is needed with primary school teachers in order to analyze how to improve the knowledge they need to teach geometry and how their CK and PCK affects students geometric thinking.

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Peaceful and Happy Schools: How to Build Positive Learning Environments

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Abstract

It is very important for students and teachers to have a positive learning environment. The school that is an institution for educating children should be a peaceful and happy environment. There are principles such as love, respect, honesty, courage, empathy and kindness in the peaceful and happy schools. This study examined the concept of a "peaceful and happy school" and aimed to describe a peaceful and happy school from the point of view of primary school teachers and primary school students. It was designed with a case-study research model. A peaceful and happy school climate is the "case" of this study. The participants of the study consisted of 126 persons, 103 primary school students, and 23 primary school teachers from public schools in Turkey. Data were collected through face-to-face interviews from primary school students and teachers. Semi-structured interview form was used for both groups. At the end of the study, primary school teachers' and students' definitions of a peaceful and happy school were presented. It was understood from the findings that primary school students and teachers want to improve the same basic issues related to a peaceful and happy school.

Keywords: Peace, Happiness, Peaceful School, Happy School, Primary School

Introduction

The word peace is frequently used to mean the absence of war. However, this definition takes a severely narrow view of the word itself. It should mean not only the absence of war but also of violence in all its forms, such as conflict, poverty, injustice, discrimination, social degradation, pressure, and exploitation. It is a virtue, a disposition, an inclination towards helpfulness, trust, and justice. As long as violent social structures exist in society, peacebuilding will not be possible. In fact, peace expresses itself in three forms—peace with nature, social peace, and inner peace (Balasooriya, 2001)—and should thus serve to create an environment that fosters the human potential optimally.

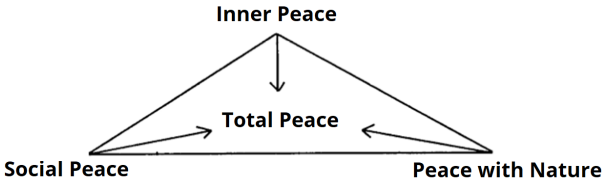

Figure 1. Sources of peace (Balasooriya, 2001)

Inner peace or peace of mind is peace with self. It is the state of harmony and peace with oneself and is associated with good health, absence of inner conflicts, feelings of kindness, compassion, serenity, bliss, happiness, contentment, joy, sense of freedom, insight, spiritual peace and satisfaction. It is the opposite of being stressed or anxious. Social peace is "learning to live together" and is the peace between man and man. For example, peace between people, conflict reconciliation and resolution, unity, friendship, brotherhood, love, acceptance, mutual understanding, cooperation, tolerance of differences, democracy, human rights, morality. Human beings are social beings; they can not live in isolation. And peace with nature implies stopping the violation of her dignity of through environmental degradation and exploitation. It refers to the harmony with natural environment and earth. Schools have a great responsibility to ensure inner peace, social peace and peace with nature. The importance of establishing peaceful schools in society is obvious. Schools are the institutions where students gain academic knowledge and professional skills as well as social responsibilities, self-control and respect for other individuals. Every child has the right to education in a safe school environment (Leach, 2005). Education encourages independent thinking, and it provides opportunities for new ideas. Free thinkers, instead of blindly following the beliefs of others, tend to make sense of the world.

Peace is a concept that includes happiness. Happiness, health, social justice, good economy, freedom for expression and support for personal growth are elements of peace. The happy people are at peace with themselves; the people who are at peace with themselves are happy. Positive schools that can support peace are key to ensuring happiness, well-being, psychological health and achievement.

Happiness is not only the purpose of life but is also a state that can be achieved and taught through human effort. The school is one of the principal sources of human development and, as such, the basic place for facilitating happiness for children. A school where students, teachers, administrators, and staff feel happy may be defined as a happy school. A happy school is a place where everyone feels a sense of belonging to a community where they feel welcomed, satisfied, secure, and can be themselves. It is the collective responsibility of students, teachers, parents, and school administrators to create a loving and happy environment in school. It is also necessary to develop the school curriculum to make the school a happy place, that is, a place where students can feel the joy of learning.

It is important to start by educating children to create lasting peace. Education must prepare the children for effective participation in a free society, in a spirit of understanding, tolerance, equality of the sexes, and friendships among all peoples. In the classroom, students are often called upon to speak, read, present their opinions in small groups, or to work on projects together. This is how communication skills are refined. It should be noted here that communication is

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the key to resolving conflict. Therefore, students learn in the classroom to respect their teachers and their friends. They are taught to allow others to speak and express their opinions, how to deal with stress, and how to conduct themselves within a group setting.

If, in speaking about education, we say that "education is peace in other words", we won't be wrong. It can be said that the wisest way to build peace is to educate individuals first and then communities. Education shares knowledge, skills, values, and attitudes that are essential for the political, economic, and social development of countries. Peace education is the process that entails the acquisition of the values, the knowledge, and developing the attitudes, skills, and behaviors for a person to be able to live in harmony with themselves, with others, and with the environs (Salomon, 2002). According to Deutsch (1993), peace education is mainly a question of developing a skillset; the main purpose here is to cultivate a nonviolent disposition and acquire conflict resolution skills. Prime examples of such would be school-based, violence-prevention, peer-mediation, and conflict-resolution programs. Formulating a new discourse of peace in schools provides educators with a choice in respect of how they think, believe, and act in response to student wrongdoing and conflict (Cavanagh, 2009).

There are five elements that are necessary for building lasting peace through education. They are 1) an education system that advocates compulsory attendance for all children and youth, 2) a sense of mutual destiny that highlights mutual goals and a common identity, 3) teaching students the constructive controversy procedure, 4) training students in integrative negotiations and peer mediation to resolve their conflicts with each other constructively, and 5) inculcating values that focus students' attention on the long-term common good of society (Johnson & Johnson, 2005).

In the world of education, there is an awareness that children should be taught the art of peaceful living. More and more concepts of peace, attitude, value, and behavioral skills are integrated into the school curriculum in many countries. There is also a growing interest in developing peace-related disciplines, such as value education, moral education, and global education. Peace education activities encourage knowledge, skills, and attitudes that assist with peaceful conflict prevention, resolve, or that create peaceful social conditions. Nonviolence and social justice values are crux peace education (Lubelska, 2018).

School climate is an important variable for a safe school environment. It refers to the quality and character of school life and includes the values, unwritten beliefs, and attitudes that become the style of interaction among students, teachers, and school administrators. The school climate determines acceptable behavior parameters among all school actors and assigns individual and institutional responsibility for school safety (Welsh, 2000). The school climate, defined as the quality of school relations, is a multidimensional concept that includes interpersonal, organizational, and instructional dimensions (Loukas, Suzuki, & Horton, 2006). The school climate develops on the basis of common perceptions of people in the school, affects all people in the school, and is influenced by their behavior (Hoy, 2003). A peaceful school is a place that grows and sustains peaceful individuals, peaceful relationships, a peaceful school community, and peace work in the world.

A positive school climate is a vital component of successful schools and is, therefore, often the purpose of school-wide initiatives (Brand, Felner, Shim, Seitsinger, & Dumas, 2003; Koth, Bradshaw, & Leaf, 2008). Through the application of peace education and the creation of a peace culture, schools can possess important benefits. Some of these benefits are:

- Schools can develop a more humanistic administration approach.
- Schools can improve relationships between teacher and parent, teacher and student, teacher and teacher, student and student, and they can improve standard of quality of teaching and learning.
- Schools can develop good attitudes in students and teachers, such as, cooperation, mutual respect and they can improve students' moral behavior.
- Schools can help healthy emotional development in students.
- Schools can facilitate socialization through participation in interactive and cooperative learning activities.
- Schools can develop creativity of students and teachers (Balasooriya, 2001).

Education engenders confidence; confidence generates hope, and hope brings peace. Confidence has been defined as the belief that a person can succeed at something and hence the stimulation of a sense of self-confidence. Knowledge allows a person to feel a sense of accomplishment and become more courageous. It is a key confidence builder. This confidence or self-assuredness, in turn, sparks motivation and optimism, happiness, or the impetus to work towards peace. This study examined the concept of peaceful and happy schools as places where children are educated.

A great deal of research has been done on children's definition and perception of peace (Covell, Rose-Krasnor, & Fletcher, 1994; Hakvoort & Hagglund, 2001; Hakvoort & Oppenheimer, 1993; Hakvoort & Oppenheimer, 1998; McLernon & Cairnes, 2001; Oppenheimer & Kuipers, 2003). A considerable amount of research has been done on school climate (Banks, 2014; Brand, Felner, Shim, Seitsinger, & Dumas, 2003; Cohen, McCabe, Michelli, & Pickeral, 2009; Egeberg, McConney, & Price, 2016; Gage, Prykanowski, & Larson, 2014; Hernandez & Seem, 2004; Koth, Bradshaw, & Leaf, 2008; Thapa, Cohen, Guffey, Higgins-D'Alessandro, 2013; Turner, Reynolds, Lee, Subasic, & Bromhead, 2014). In these studies, it was concluded that children can feel the concept of peace from an early age in relation to their cognitive development, and positive school climate predicted many variables, such as academic achievement, self-esteem, and well-being.

Purpose of the Study

This study examined the concept of a "peaceful and happy school" and aimed to describe a peaceful and happy school from the point of view of primary school teachers and primary school students. For this purpose, basically, two answers were sought:

1. What is a peaceful and happy school like?
2. What can be done to build a peaceful and happy school?

Method

Research Paradigm

The research was designed with a case-study research model—one of the qualitative research models. A peaceful and happy school climate is the "case" of present study, and it is discussed in the introduction. A case study is an intensive, holistic definition and analysis of a phenomenon or social unit (Merriam, 1988). According to Creswell (2007), it is a qualitative research approach in which the researcher examines one or more of the cases in-depth and defines the situations and themes. According to Yin (1994), a case study is an empirical research method that studies a current phenomenon in its real-life context. The purpose of a case study is to understand

the process in detail, but this may include examining single or multiple cases and numerous levels of analysis. Although a case study has been defined in different ways, in-depth study and description of a situation is the common point of definitions. A case study is an important method of obtaining information because it provides rich and important perspectives about events and behaviors (Bloor & Wood, 2006; Brown, 2008).

Participants

The participants of the study consisted of 126 persons, 103 primary school students, and 23 primary school teachers. The personal information of the students is as follows:

- Of all the students, 62 were girls and 41 were boys.
- The ages of the students varied between seven and ten and the average age was nine years.
- The students were selected from four different public schools in accordance with the official permits. The socio-economic level of the schools was largely similar and was identified as "intermediate" by the school administration. Student families were generally civil servants or workers.
- Academic achievement of students varied. Participants included students with low, intermediate, and high academic achievements.

The personal information of teachers is as follows:

- Of all the teachers, 14 were female and nine were male.
- The ages of the teachers varied between 29 and 54, with an average age of 39 years.
- Teachers worked in 4 different public schools and all were primary school teachers.
- The teachers' years of working in the profession varied between seven and 33 years.

Data Collection Process

Data for this research were collected through face-to-face interviews from primary school students and teachers. Permits were obtained from the Directorate of National Education to conduct interviews. A semi-structured interview form was used during the interviews. The interview form that was developed for recording students' views was also used as a teacher interview form. In particular, the same question was posed in different ways in case the students could not understand.

Appointments were made with teachers and the school administration to participate in the interview. Interviews with the students took place in each student's own classroom or in a suitable room of the school and lasted approximately 15 minutes. Interviews with teachers were conducted in the teachers' room and lasted approximately 15 minutes. The collected data were transcribed and prepared for analysis.

Data Analysis

The raw data obtained from the interviews were analyzed and interpreted using a "content analysis technique" (Yıldırım & Şimşek, 2005). The first analyses were made and then an assigned faculty member rechecked the analyses. In case of disagreement, the related category was revised. Code names, such as "S1, S2, ..., S103" for students, and "T1, T2, ..., T23", for teachers were given in the order of the interviews. These code names were used when quoting the words of the students and teachers.

Validity, Reliability and Credibility of the Study

All studies are expected to provide a certain level of validity and reliability. Merriam (1998) proposed several strategies to obtain internal validity in case studies. These strategies include obtaining from colleague opinions about the findings (peer examination), data checking with the data source (member checks), the researcher's expressing their own views and thoughts at the beginning of the study (researcher's biases). For the internal validity of this study, the data were confirmed to the students and teachers. Additionally, opinions were obtained from an expert academician. For external validity, rich, thick description and typicality, or modal category techniques were used. Also, in order to increase the internal reliability and validity of the research findings, each step of the study was explained in detail and frequently quoted from the opinions of students and teachers. In order to ensure the credibility of the study, raw data were checked and confirmed by the teachers and students. The research report was also presented in detail to enable the reader to understand that the findings were safe.

Findings

Findings Related to the Primary School Students' Definition of Peaceful and Happy School

Primary school students were asked to give their definition of a peaceful and happy school. The answers from all 103 students were collected in 12 categories, as shown in Figure 2.

According to primary school students, these categories are: Fun place, a quiet place, a place where the teachers are not sad, a place with values, a place like home, a place where ideas are respected, a place without a fight, a place with rules, a place where games are allowed, a place where no one is scared of the teacher, a place where responsibilities are fulfilled and a decent and respectful place.

As Table 1 depicts, primary school students mostly used "fun" and "quiet" to describe a peaceful and happy school. The concept of fun took first place among the answers given when defining a peaceful school. The happiest place for them is where they have fun and the school gives them peace only when it is fun.

> *S60: It's a fun place. It gives me pleasure.*
>
> *S73: A peaceful school is where I enjoy myself. Who can be peaceful or happy in a boring place?*

Silence can sometimes be important and necessary for adults to feel at peace. But asking for silence in childhood is a situation that contradicts the developmental tasks of children. That is because, by nature, children learn not by silence but by communication, movement, and active action. They act aloud to understand as they explore the world. Therefore, the idea of silence is thought to be imposed by adults. The sentences of some of these students are as follows:

> *S9: It is a quiet place where the teacher does not get upset.*
>
> *S37: It's a quiet place where everyone is kind to each other.*

Fifty-three students mentioned not to upset the teacher and not to bother him. According to them, the teacher should not be upset or annoyed.

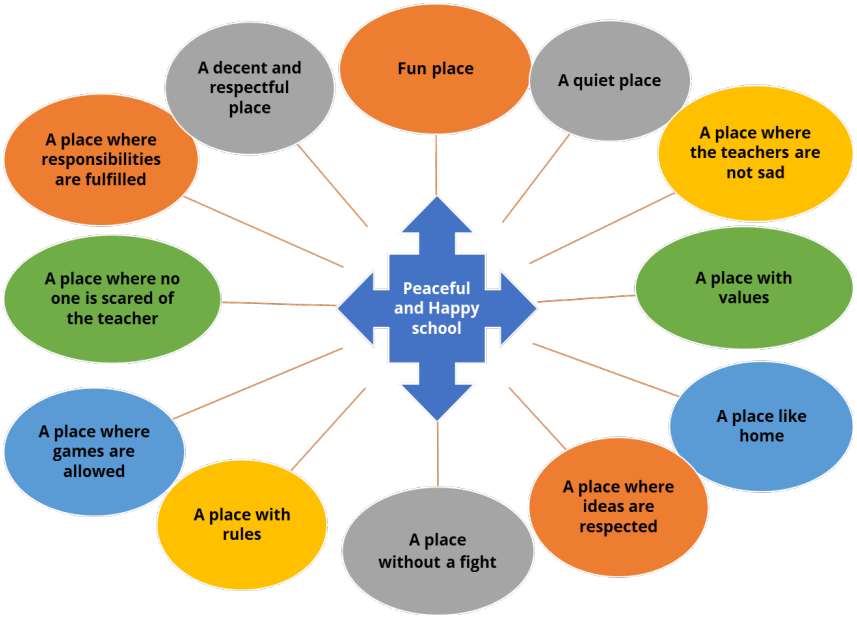

Figure 2. Primary school students' definition of a peaceful and happy school

Table 1. *Codes used in definitions and students' frequency of making them*

	What kind of place is a peaceful and happy school?	Codes used by students	Frequency (f)
1.	It's a fun place.	enjoyable, funny	77
2.	It's a quiet place.	noiseless, quiet	65
3.	It's a place where teachers aren't sad.	sad teacher, happy teacher, don't upset the teacher	53
4.	It's a place where everyone is decent and respectful.	sensitive, courteous, respect, deferent, regardful	48
5.	It's a place where there's no fighting.	have a fight, scuffle	47
6.	It's a place with rules.	Avoid running on stairs, don't run in corridors, respect the principal, keep the rules, damage class items, throw trash on floor, to use the school water without wasting	45
7.	It's a place where no one is scared of the teacher.	fear of the teacher, scared of the teacher, afraid of the teacher, yelling teacher, shouting teacher, violence	44
8.	It's a place where games are allowed.	playing field, playground, outdoor playing	40
9.	It's a place like home.	a place with a kitchen, home comfort, feel comfortable, feel relaxed	32
10.	It's a place where responsibilities are fulfilled.	prepare a school bag, listening to the lesson, speak by permission, do homework	29
12	It's a place with values.	Honesty, love, respect, honesty, helpfulness, sharing, compassion, kindness	28
12.	It's a place where ideas are respected.	respect for different thoughts, respect for thoughts	22
13	It's a place where everyone is happy.	inner happiness	1

S100: Students should be in class when the break is over and should not make any noise. Otherwise, the teacher is upset. We must not annoy the teacher.

S97: In peaceful schools, teachers are not sad and frustrated. Forty-eight students talked about being respectful and decent. A peaceful school is a place where respect is important to them.

S23: It is a place where everyone is respectful.

S88: Decent students are in peaceful schools. A peaceful school is a place with mostly decent students.

Forty-seven students defined a peaceful school as a place where there is no fighting or bullying. Forty-five students emphasized the importance of school rules for a peaceful school. It is thought that the ideas of following the rules or creating rules together are two subjects that teachers frequently impose on the students. Children are aware that they must follow the rules and this is a positive attitude. But it is an incomplete learning that the child think only rules must be followed for peace and happiness. Below are excerpts from those students' own words.

S25: It is a place where there is no fighting. Nobody should disrespect each other.

S8: A peaceful school is a place where there is no lie, and people don't shout loudly at each other.

S103: Students should enter the class when the break is over. He can talk to his friend for 2–3 minutes. He must not run or shout in the corridors of the school.

It can be interpreted that forty-four students are unhappy because of the hard attitude of the teacher. This is seen from their definition of a peaceful school as a place where teachers are not angry, shouting, or calling violence. Below are excerpts from the responses of those students.

S6: It is a place where we are not afraid of the teacher.

S79: This is where the teacher does not beat or hit hard.

S101: In such schools, teachers do not get angry or shout. I'm very afraid of such a teacher. I feel at peace when the teachers are not rude to us.

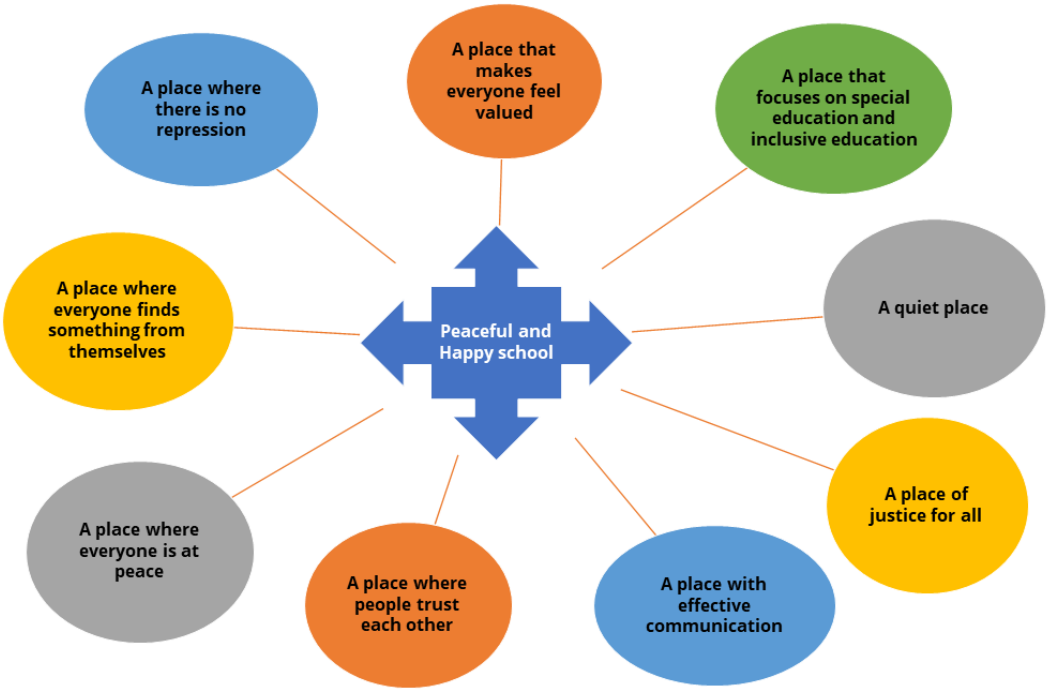

Figure 3. Primary school teachers' definition of a peaceful and happy school

Some students consider games as an important tool for peace. According to them, they would be very happy if they were allowed to play more games. Happy children are in peaceful schools. These children also want to increase the number of playgrounds in their schools because, according to them, peace is playing games.

Thirty-two students want to feel at home while at school. For example, there are students who think that if a school has a kitchen, it would make them very happy. There are some students who say that they would be happy to see their favorite toys, books, and personal belongings like family photos at school.

> *S99: I have to be as comfortable as in my house. At peace, that's it.*

> *S1: Every place that looks like my home is peaceful. I am happy everywhere that looks like my room.*

Some students talked about fulfilling responsibilities; some talked about values, such as love, helpfulness, solidarity, empathy, and others talked about respecting different ideas. It is an important finding that respecting thoughts or different thoughts is valuable for a child and seen as the key to peace. Students' perceptions that universal values will ensure peace are also very important. Below are direct excerpts from the students' sentences.

> *S10: A peaceful and happy school, love, respect, honesty, helpfulness, sharing, compassion, in short, with good morality.*

> *S3: A peaceful class is like this: Everyone respects the opinions of others. Students listen carefully to what the teacher tells.*

> *S61: It is a place of good people. It is a place where ideas are respected.*

One of the most remarkable answers among 103 students is the answer of the student with code name S11. S11 draws attention to inner happiness. He thinks that school will be peaceful if people feel happy. Moreover, he believes that the school will feel this happiness.

> *S11: If everyone is happy in the school, the school will be peaceful and happy. School feels like a human. Because everyone smiles.*

Table 2. *Codes used in definitions and the teachers' frequency of making them*

	What kind of place is a peaceful and happy school?	Codes used	Frequency (f)
1.	It's a place where makes everyone feels valued.	appreciation, value, precious	23
2.	It's a place where there is no repression.	violence, pressure someone	17
3.	It's a place where everyone finds something from themselves.	special items, favorite items, pleasures	14
4.	It's a place of justice for all.	equality, equal rights, discrimination	13
5.	It's a place where people trust each other.	trust each other, do something behind someone's back, confidence, put one's trust in, take on trust	10
6.	It's a place where everyone is at peace with themselves.	everyone is at peace, inner peace	9
7.	It is a place with effective communication.	good communication, dialog, cooperation with parents, dialog with teacher	9
8.	It's a quiet place.	calm, tranquil, restful, noiseless, quiet, hushed	4
9.	It's a place that focuses on special education and inclusive education.	special education, inclusive education, disabled people, autism, individual difference	2

Table 3. *Suggestions of teachers for a peaceful and happy school*

	Suggestions of Teachers	Frequency (f)
1.	Suggestions for "self"	23
	Teachers should be made to feel happy.	
	Teachers' self-esteem and self-confidence should be increased.	
	Teachers should be made to feel valuable.	
	A class identity must be created for each student.	
2.	Suggestions for values	21
	The teacher should treat the students fairly and the school principal should treat the teachers fairly.	
	The importance of values, such as tolerance, respect, and love, should be emphasized.	
	Universal values should be taught.	
3.	Suggestions for the physical characteristics of the school	18
	School should not be a boring place; it should be transformed into a relaxing place.	
	The physical conditions of the school should be improved.	
	The school environment should be arranged like a home environment.	
	A variety of activity rooms should be created to address the interests of everyone in the school.	
	Schools should be turned into campuses with many social facilities.	
4.	Suggestions for relationships	15
	A communication similar to the family's communication with the child should be between the student and the teacher.	
	Cooperation with parents should be made.	
	Teachers should establish good relations with each other.	
	Trainings should be provided to build trust among people.	
5.	Suggestions for learning and teaching	9
	Fun activities for teachers should also be organized.	
	Specific or individualized conditions should be created for each child.	
	Students should enjoy learning.	
6.	Suggestions for unwanted behavior	8
	Seminars on bullying should be organized.	
	Strategies should be developed to prevent school violence.	
7.	Suggestions on the Ministry of National Education and school administration	7
	School principals should change frequently.	
	Excursion activities organized at school should be increased.	
	The school management should receive regular opinions and suggestions from the students and determine their needs.	
	Teachers who are professionally equipped should be hired.	

Findings Related to the Primary School Teachers' Definition of a Peaceful and Happy School

Primary school teachers were also asked to define a peaceful and happy school. The answers were collected in nine categories as shown in Figure 3.

According to primary school teachers, these categories are: A quiet place, a place that makes everyone feel valued, a place that focuses on special education and inclusive education, a place of justice for all, a place where people trust each other, a place where everyone is at peace, a place where everyone finds something from themselves, a place where there is no repression.

As Table 2 indicates, the teachers mostly emphasized that everyone felt valuable when defining this school. All of the teachers want to see value and the place where they feel they are valuable is peaceful and happy for them. According to seventeen teachers, a peaceful place is a place where there is no pressure, bullying, or violence. Fourteen teachers want to feel at home, to see their personal belongings, their favorite dessert. The last book they read at school puts them more at peace. Some teachers (*f*: 13) want a fair world for all. The place where the value of justice is felt is peaceful for them. Thirteen teachers mentioned that people should trust each other. According to them, peace can only occur when people trust each other.

Nine of the twenty-three teachers mentioned internal peace. People must first be at peace with themselves, according to them. The place where individuals are at peace with themselves is peaceful. Some teachers (*f*: 9) mentioned the importance of communication and stated that they believe that quality communication brings peace. The emphasis on silence or tranquility is important for peace among teachers as well as for primary school students. Four teachers stated that they thought that a quiet place was peaceful. Two of them believe that a place where people with disabilities are cared for is peaceful. Individual differences should be considered. Below are the responses of some of the twenty-three teachers.

> *T1: Feeling precious, very nice. One can only find peace in a place where one feels one is valuable. One is at peace, where people trust each other. One is peaceful where there is no repression and bullying. For me, there is no peaceful place. There are peaceful people.*

> *T6: I want to trust the people around me. Everyone should believe in each other. Everyone should be honest. There should be no lies in relationships. Such a place is peaceful.*

Table 4. *Suggestions of students for a peaceful and happy school*

	Suggestions of Students	Frequency (f)
1.	Suggestions for the physical characteristics of the school	67
	Playgrounds should be established in the school.	
	The school should be fun, not boring.	
	The school environment should be arranged like a home environment.	
	The most popular personal belongings should be brought to the school and placed in a suitable place in the classroom.	
2.	Suggestions for unwanted behavior	59
	Students should not hit each other.	
	Nobody should swear.	
3.	Suggestions for values	56
	Everyone should respect each other.	
4.	Suggestions for learning and teaching	51
	Lessons should be fun.	
5.	Suggestions for contact	48
	Teachers should be good friends with each other.	
	Everyone should have good friends.	
	Even if people think differently, there must be unity.	
	The headmaster should not shout at the students.	
	Teachers should not be angry with students.	
	People should not be angry and rude to each other.	
6.	Suggestions for rules	45
	While the Turkish Independence Anthem is sung, no one should move.	
	Students should not throw trash to the floor. When they meet the headmaster, they must stop and wait and show respect for him.	
7.	Suggestions for reward	12
	The school should give gifts to students for their good behavior.	
	The school headmaster should give a surprise prize to the smartest student of every day.	

> *T17: There should be no violence, no pressure, no threat. I should do a thing just because I want to. I should to enjoy what I do. The key is to eliminate psychological violence and bullying.*
>
> *T23: The place can be peaceful if parents manage to have good relations with teachers, teachers with teachers, and teachers with students*

Findings on the Suggestions of Students and Teachers for a Peaceful and Happy School

Primary school students and teachers were asked what they recommended for a peaceful and happy school. These suggestions are included in Tables 3 and 4.

As Table 3 shows, teachers mostly focused on the concept of self. Twenty-three teachers talked about self-esteem, creating an identity, and feeling valuable. According to these teachers, it is important to create a class identity for the students. There are twenty-one teachers who drew attention to the importance of universal values, such as tolerance, respect, love, and justice. Some teachers mentioned that the physical characteristics of the school should be improved. Fifteen teachers' suggestions were to ensure effective communication. Nine teachers proposed to transform learning into a fun form for peaceful schooling. Some teachers talked about the need to prevent bullying and violence, while others made suggestions to government officials.

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As Table 4 shows, students mostly focused on the physical characteristics of the school. Children want to increase the number of playgrounds to feel at peace. In addition, some students said that they wanted to feel as comfortable at home as they were at school. Thus, they suggested that the school be compared to the home environment. Students who think that unwanted behaviors should be prevented suggest a school where there is no violence (f: 59). Fifty-six primary school students mentioned that everyone should be respectful to each other. Fifty-one students suggested that the lessons should be fun for peaceful schools. Forty-eight of the students made suggestions regarding communication. Particularly, the recommendations of the student code-named S57 are remarkable: He explained that the teachers in a happy school should have good relations with each other. He also stated that the children felt this relationship and evoked negative feelings towards the students with whom the teacher disagreed or disliked in the other teacher's class. Forty-five students who believe that the rules should be followed think this is essential for peaceful schools. Twelve students wanted to be rewarded. According to them, the source of a peaceful school is rewards.

Discussion and Conclusion

It is understood from the findings that primary school students and teachers want to improve the same basic issues related to a peaceful and happy school. As Figure 4 shows

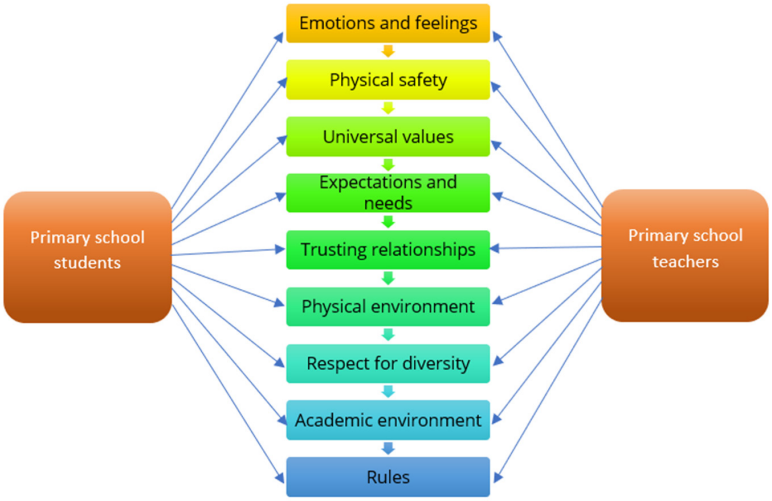

Figure 4. Concept of a peaceful and happy school according to primary school teachers and students

that emotions and feelings are important for both groups. Both students and teachers need to feel valued. Teachers have also dreamed of a school where everyone feels happy.

According to the findings of this study, the issue of physical safety is also an issue to be considered. Children do not want teachers or classmates to use physical violence against them. Teachers desire a school without violence and bullying. Bully students scare other students with their words and actions. Bullies rob others of their right to free learning, making other children feel unsafe and often causing them to be absent from school (Olweus, 2002; Olweus, 2003). Students who are exposed to bullying have various problems. It was found that students who were bullied (victim) had feelings of anxiety, anger, and helplessness; it is claimed that bullying can be a reason for not wanting to be in school or even attempting suicide. Furthermore, it has been revealed that as the absenteeism of the students who have been bullied increases, their self-esteem decreases (Elliot, 1992).

Universal values are very important for peaceful and happy schools. It is not possible to build a peaceful school without love, respect, and tolerance. Teachers and students alike have some expectations and needs. The most basic need for teachers is to feel valued. Students want a fun-filled school environment.

Relationships are the source of peace for both groups. Children want to establish good relations with their peers, and moreover, they want to make good friends. Teachers want to have good relations with other teachers, parents, and school administrators. According to the teachers, it is very important that people trust each other. Similarly, in a study by Slaughter-Defoe and Carlson (1996), children viewed teacher-child relations as the most important dimension of school climate. Children also stressed teacher fairness, caring, and praise for effort as well as the importance of moral order, values, following school rules, and performing well.

Some children related peace to “unity among people” (Oppenheimer & Kuipers, 2003). Hakvoort (1996) emphasized the importance of positive social themes involving friendship and care for others for a true understanding of positive peace. According to a study by Koth, Bradshaw, and Leaf (2008), school size, characteristics of the teacher, class size, and the concentration of students with behavior problems are significant predictors of perception of a positive school climate. These findings suggest that features of the classroom environment are important to consider when purposing to improve school climate.

According to the findings of the present study, teachers and students suggest that the physical school environment should be reorganized to make them feel more comfortable. Both groups want to feel as if they are in their own home while at school. Children think that there is a need for big playgrounds for a peaceful and happy school. Boredom or having nothing to do can be the cause for undesirable behaviors, but the children happily involved in play reflect an engaging environment and support a peaceful environment (Levin, 2003).

Teachers and students alike think that respect for differences and different ideas is an important element of a peaceful school. People may just look different and think differently.

According to teachers and primary school students, the academic environment is critical for creating peaceful and happy schools. A positive academic climate is the key to peace. Children desire fun lessons. Teachers propose individualized teaching programs. According to teachers, students should enjoy learning. Another important positive school-climate-related dimension is rules and norms. According to the findings, obeying the rules is necessary for a peaceful and happy school. In the school environment, each individual has duties and responsibilities. There are also some rules for living together. Problems arise when these rules are violated. Some researchs underscore the importance of school rules in regard to dealing with students’ undesirable behavior (Gottfredson, Gottfredson, Payne, & Gottfredson, 2005; Halstead, & Taylor, 2000; Malone, & Tietjens, 2000; McGinnis, Frederick, & Edwards, 1995).

There are many studies in the literature supporting the results of this study. It was determined that variables, such as teacher support, participation in classroom activities and decisions, peer relations, defined rules, physical conditions of class and school, which are the characteristics of positive school climate, were related to the academic achievements of students and teachers (Brand, Felner, Shim, Seitsinger, & Dumas, 2003). Lower levels of violence are observed in schools where students are involved in decision-making, where rules are clear, consistent, and impartial, and where students are respected (Olweus, 2003). Welsh (2000) concluded that the three school climate variables were inversely related to bullying behavior and victimization. These variables are respect for students, student participation, and clarity of school rules.

According to Bandura’s social learning theory, bullying behaviors are formed by the interaction of individual and environmental factors, and therefore, the social environment has direct and indirect effects on the formation of bullying. Direct

effect: Children learn the aggressive behavior model from their peers and adults. Indirect effect: Children receive and accept perceptions, norms, and trends (Natvig, Albrektsen, & Qvarnstrom, 2001)

Suggestions

According to the results of this research, the following are recommended for peaceful and happy schools:

For effective relationships, trust should be built. Friendship and a good relationship between students and teachers as well as between teachers and teachers should be ensured.

It should be felt that everyone's feelings and thoughts are valuable.

Measures should be taken to eliminate physical and psychological violence at school.

Students should first be directed to work for their inner peace and happiness. They should be made to feel that inner peace will make the school peaceful.

Students should be made aware that peace can only be built in collaboration.

It is very important to develop a sense of belonging to the school. So, the physical conditions of the school should be improved. Students and teachers should feel at home.

School should not be a boring environment. For this, everyone in the school must act together; expectations and needs should be fulfilled.

Children are happy in a school where they learn and play. In order for future generations to contribute to a more peaceful world, all students should feel happy.

Courses should be engaging and fun for students, and courses should have creative and colorful instructional materials and fun activities. In addition, students should enjoy learning.

Teachers should be informed about alternative ways or programs on how to build peaceful and happy schools

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The "Motivational Climate in Physical Education Scale" in Greek Educational Context: Psychometric Properties and Gender Effects

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Abstract

The aim of this study was to carry out a preliminary validation of "Motivational Climate in Physical Education Scale" in Greek educational context and specifically in relation to elementary school students. The participants of the research were 184 (101 male and 83 female) students of grades 5th and 6th from four elementary schools, in different geographical areas of Greece. The Greek version of Motivational Climate in Physical Education Scale was used for the data collection. The statistical analyses that were applied included: descriptive analysis, exploratory factor analysis, reliability analysis and the One-way ANOVA analysis. The results showed that the questionnaire retains the structure of the four factors that its designers have recommended and the internal cohesion of the four factors was high (.85 the lowest and .90 the highest). Survey data revealed that the Greek version of the "Motivational Climate in Physical Education Scale" is a reliable tool for the measurement of motivational climate in the Greek educational elementary school environment, and the gender determines the climate of motivation with male students scoring higher in task involving and autonomy factors whereas female students perform better in task involving and relatedness.

Keywords: Motivational Climate, Students of Primary School, Physical Education Classes

Introduction

Physical education (PE) is an invaluable subject in primary and secondary school curricula because of its great potential for students' physical, mental, emotional, and social development (Bournelli, Koutsouki, Zografou, Aggelonidis, Chatzopoulos, & Agalianou, 2012). The main objective that has been highly prioritized in school curricula in recent years has to do with lifelong physical exercise. In other words, the acquisition of knowledge and experience of physical training so that students will sustain good health after school (Hagger & Chatzisarantis, 2007). During the school years, dealing with health issues promptly and efficiently is crucial (Institute of Educational Policy, 2014; Bournelli et al., 2012).

Despite tangible benefits that derive from PE and after-school sports activities, students, as they grow older, become more reluctant to participate and gradually spare no effort during PE lessons (Iconomescu, Mindrescu, & Popovici, 2018; Ntoumanis, Barkoukis, & Thøgersen-Ntoumani, 2009). The big challenge of PE teachers is whether and how they will succeed in convincing students to exert their energy on activities that fit them, how they will make the most of knowledge and experiences they gain, and finally in which way students come to be motivated for lifelong exercise (Fox, 1992). Therefore, the school climate and the rapport teachers build up with students are essential.

Parents' positive attitude toward school is another element that nourishes a climate of motivation because it influences the quality and quantity of students' interaction (Koundouras, 2017). Additional contributing factors are character, school subject, and feedback (Parissi, Mouratidou, Koidou, Tsorbatzoudis, & Karamavrou, 2015). According to Treasure and Roberts (1995), the motivational climate has six dimensions reflected on the acronym T-A-R-G-E-T, which stands for Task (classroom activities), Authority (for students to have a say in decision-making), Recognition (when students are prized), Grouping (learning to work together as a team), Evaluation (refers to assessment and feedback), Time (flexible time for task completion) Morgan (2017) supported that the relationship between educator/trainer and trainee should be further explored and that T-A-R-G-E-T should be modified to include "relationships" in the Recognition section.

However, as Colquitt, Walker, Langdon, McCollum, and Pomazal (2012) mentioned, PE's objective to provide an effective learning experience has been strongly criticized. PE teachers must thus know their students' attitude toward the subject, and in particular, its main components and target, and they must explore their students' individual learning needs to improve the learning process by exerting innovative teaching methods (Cid, Pires, Borrego, Duarte-Mendes, Teixeira, Moutão, & Monteiro, 2019). Lastly, students' views on the subject are a key element in the whole assessment of the teaching procedure (Ghofrani & Golsanamlou, 2012).

PE teachers are advised to have at their disposal a reliable measuring instrument of the motivational climate during the lesson to modify the flow of it through a range of activities. By doing so, they can assess the teaching procedure and develop the potential of the climate of motivation. This study

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aimed to conduct a preliminary validation of the "Motivational Climate in Physical Educational Scale" (MCPES) (Soini, Liukkonen, Watt, Yli-Piipari, & Jaakkola, 2014) in the Greek educational context.

Methods

Participants

The sample of the study consists of 184 students of the last two grades from four elementary schools in different geographical areas of Greece (Imathia, Chanea, Kozani, and Rhodes) (Table 3). The selection of schools was randomly done. Initially, four prefectures from the country were chosen, and then the list was narrowed down to particular schools from these prefectures to which complete questionnaires were given for the survey.

Instrument

The Greek version of the MCPES (Soini, Liukkonen, Watt, Yli-Piipari, & Jaakkola, 2014) was used. The questionnaire consists of eighteen items researching the four parameters of motivational climate during the PE lesson. The 1st factor, "Autonomy support," consists of five items and examines the opportunities that PE provides to support students' independence, free choices, and the extent to which they can intervene in shaping the lesson (e.g., Students are given the opportunity to affect the way PE lessons are run.). The 2nd factor, "Social relatedness support," consists of four items and traces the existence of team spirit and cooperation to meet the challenges of a lesson (e.g., During PE lessons, students "pull together."). The 3rd factor, "Task-involving climate," consists of five items and considers any effort put into for personal improvement and the acceptance of errors as part of the learning procedure (e.g., It is important to keep trying even though you make mistakes.). The 4th factor, "Ego-involving climate," consists of four items and reviews the presence of competitive climate in the lessons, sense of superiority over classmates, and self-evaluation (e.g., During PE lessons, students compete with one another in terms of their performance), and this scale uses a Likert-type scale ranging from 1 (totally disagree) to 5 (totally agree).

The translation and amendment of the questionnaire in the Greek language were performed after considering the methodology (back-to-back translation technique) recommended by Banville, Desroriers, and Genet-Volet (2000).

The survey organizers had to ask for permission from the Ethics Committee of the Democritus University of Thrace and the Minister of Education to conduct the survey at schools. The approval was granted by the university in February 2019 and by the Ministry of Education a month later. The study was conducted in March and April 2019. Parental consent was asked to secure students' participation in the research. It was a written permit, and no data revealing the identity of the students for the completion of the questionnaires were required.

Statistical Procedure

For the statistical analysis of the data, the following methods were used: descriptive analysis (means, standard deviation, Kaiser–Meyer–Olkin (KMO) and Bartlett's test of sphericity and measure of sampling adequacy (MSA)), Exploratory factor analysis, reliability analysis (Cronbach's α), and one-way analysis.

Results

Suitability of Data and Variables

Researchers have affirmed that the first stage of a factorial analysis should explore the suitability of data and variables that are to be factorized because not all of them will do. This procedure involves checking the specific statistical index, such as a partial connection factor, which is controlled with the value of KMO, Bartlett's Test of Sphericity, and MSA (values that are near 1 indicate the suitability of variable).

Table 1. *KMO and Bartlett's Test*

KMO and MSA		.828
Bartlett's Test of Sphericity	Approx. Chi-Square	1946.816
df		.153
p		.000

Table 1 demonstrates that the statistical criterion of KMO is high (.828), thereby suggesting that the connections between the data of the survey are high too. Moreover, Bartlett's Test of Sphericity declines the zero hypotheses that the connectivity table is unique (value Bartlett's Test of Sphericity Approx. Chi-square 1946.816, degree of freedom 153, and p = .000).

These findings displayed that the survey's data are appropriate for factorial analysis. However, for the examination of whether all the variables fit the model, the value of MSA was considered. According to the results, all the variables meet the suitability criterion, and the index fluctuates from .80 minimum to .89 maximum. Hair, Anderson, Tatham, and Black (1998) maintained that .9 and .8 are proper values, .7 and .6 are accepted but not very reliable, and values below .5 should be eliminated from the analysis.

Exploratory Factor Analysis

Eighteen questions relating to motivational climate are exploratory factors analyzed using principal component analysis solution with direct oblimin rotation. The analysis yields four factors explaining a total of 72.45% of the variance for the entire set of variables

The 1st factor "task involving" explains 19.95% of the total variance and contains five items that examine the efforts to be made for personal improvement (Table 2). Factor one "task involvement" yields a subscale score of M = 4.03 (SD = .94) (Table 3). The 2nd factor "autonomy" accounts for 19.68% of the total variance, comprises five items, investigates the opportunities that PE provides to support students' autonomy (Table 2), and yields a subscale score of M = 3.24 (SD = 1.02) (Table 3). The 3rd factor "social relatedness" explains 17.37% of the total variance and contains four items (Table 2) that investigate group mentality and collaboration to cope with the difficulties of a lesson. The 3rd factor yields a subscale score of M = 3.08 (SD = 1.12) (Table 3). The 4th factor "ego involving" explains 15.46% of the total variance and comprises four items (Table 2) that investigates the antagonistic environment during a lesson. Factor four yields a subscale score of M = 2.43 (SD = 1.07) (Table 3).

Reliability Analysis

The internal cohesion of the questionnaire was checked with Cronbach's α test. The results support the structural validity of the questionnaire, and the factors were found to have a high degree of internal cohesion. Table 3 shows that the values of the factors are satisfactory ($\alpha > .85$) and presents the means and standard deviations of the main variables for the overall sample and for males and females. Generally, students perceived a high task-involving climate, relatively positive autonomy climate, moderate relatedness, and weak ego-involving climate.

Differences in Relation to Gender

For the determination of whether there are statistically significant differences in the scale factors between boys and girls, the one-way ANOVA analysis was conducted. The results showed that there were statistically significant differences for

Table 2. *Factor Analysis and Loadings for the 18-Item "MCPES" (Greek Version)*

Items	Factors			
	Task involvement	Autonomy	Social relatedness	Ego involvement
Students must try their best during PE lessons.	.83			
Learning new things makes me want to learn more.	.83			
Progressing every year in our skills is crucial.	.85			
Students must try to improve their skills.	.80			
It is important to keep trying even though you make mistakes.	.82			
Students have a significant role in decision making in PE lessons.		.87		
Students are given the opportunity to affect the way PE lessons are run.		.85		
Students have significant freedom to make choices during PE lessons.		.86		
Students are given the opportunity to select activities according to their interests.		.84		
Students can affect the course of PE lessons.		.77		
Our PE class has a good sense of unity.			.88	
Our PE class is united when practicing during PE lessons.			.86	
Students really "work together" as a team.			.84	
During PE lessons, students "pull together."			.90	
Students must show that they are better in PE than others.				.78
During PE lessons, students compare their performance, mainly with that of others.				.82
Students must succeed better than others.				.80
During PE lessons, students compete with one another in terms of their performance.				.84
Total variance: 72.45%				
Factors' variance				
Eigen values				

Table 3. *Means, Standard Deviation, Cronbach's α and Statistically Significant Differences Between Boys and Girl*

	Overall *n*= 184		Male *n*= 101		Female *n*= 83		Statistical differences			Cronbach's α
	M	*SD*	*M*	*SD*	*M*	*SD*	*f*	*p*	n^2	alpha
Task	4.03	.94	3.81	1.05	4.29	.69	12.8	.001	.08	.89
Autonomy	3.24	1.02	3.44	.99	2.99	.99	9.40	.001	.05	.89
Relatedness	3.08	1.12	2.75	1.13	3.49	.98	22.40	.001	.11	.90
Ego	2.43	1.07	2.78	1.20	2.02	.71	24.60	.001	.12	.85

the factors "task involving climate" [$F_{(1,183)}$ = 12.8; p < .001, n^2 = .08]; "autonomy" [$F_{(1,183)}$ = 9.40; p< .001, n^2 = .05]; "relatedness" [$F_{(1,183)}$ = 22.4; p < .001, n^2 = .11]; and "ego involving climate" [$F_{(1,183)}$ = 24.6; p < .001, n^2 = .12]. More specifically, the results indicate that (a) male students presented a statistically higher score (M = 3.44 and SD = .99) regarding the factor "autonomy" in relation to female students (M = 2.99 and SD = .99), (b) male students presented a statistically higher score (M = 2.78 and SD = 1.20) regarding the factor "ego involving climate" in relation to female students (M = 2.01 and SD = .71), (c) female students presented a statistically higher score (M = 4.29 and SD = .69) regarding the factor "task involving climate" in relation to male (M = 3.81 and SD = 1.05), and (d) female students presented a statistically higher score (M = 3.49 and SD = .98) regarding the factor "relatedness" in relation to male students (M = 2.75 and SD = 1.13) (Table 3).

Discussion

One of the main objectives of PE is students' motivation for active participation in the lesson, which for many, is the result of the motivation climate that prevails during the learning process. Students' active involvement is essential and a basic requirement to fulfill the potential of lifelong exercise. Consequently, a PE teacher needs an instrument to monitor the effort that a student makes to enhance his performance in a lesson. Therefore, this study aimed to update the questionnaire MCPES (Soini et al., 2014) in the Greek educational context and to look into gender as a differentiation factor of the motivational environment.

Regarding the validity of the factors and the structure itself, MCPES has shown a structure of four oblique factors, coinciding with the findings of Soini et al. (2014). As far as reliability is concerned, results have shown the required internal consistency and temporal stability of the scale, with results similar to the findings of Soini et al. (2014) (Cronbach's α autonomy = .85, relatedness = .88, task = .80, and ego = .78) and Jaakkola, Wang, Soini, and Liukkonen (2015) (Cronbach's α autonomy = .85, relatedness = .88, task= .80, and ego= .78).

PE teachers and the teaching methods they adopt appear to shape a motivational environment focused on learning itself and on instilling a sense of autonomy among students because the factors "task involving" and "autonomy" have the highest score. Moreover, the lesson favors the development of social bonds and cooperation as the factor relatedness is relatively high. By contrast, the factor ego comes at the bottom of the table. The findings of the study justify the writers' claim that PE educators succeed in their ultimate aim to achieve lifelong exercise through the program given that those who are determined to take their fitness level to a higher level usually continue doing so with patience and commitment for a long time regardless of their views on the matter (Papaioannou, Theodorakis, & Goudas, 2003).

Gender proves a differentiation factor of the motivational environment. Males, in particular, are more independent and self-oriented, unlike females who are more sociable and task-oriented. The results of the study coincide with those of Castro-Sánchez, Zurita-Ortega, Garcia-Marmol, and Chacón-Cuberos (2019) who stated that for boys' collaboration is not their first priority because they believe that they can cope on their own no matter how complicated a problem may be. Conversely, girls cooperate effort lastly and develop social relationships. The results of the survey partly match those of Jaakkola, Wang, Soini, and Liukkonen (2015), but it also negates it. They agree that boys are more autonomous and ego-involved ($M_{autonomy}$ = 3.02 and ego = 3.24) from girls ($M_{autonomy}$ = 2.91 and ego = 2.86). Nevertheless, Jaakkola, Wang, Soini, and Liukkonen (2015) suggested that boys are more sociable (M = 3.23) than girls (M = 3.11) and that there is no difference between the genders regarding task-involving climate. Any disparities between the surveys might arise from the different age samples as the Jaakkola, Yli-Piipari, Barkoukis, and Liukkonen (2017) work involved 15 years old students (9th graders) and the current 11–12 (5th and 6th graders).

Given the survey and the discussion, the following conclusions can be drawn:

a. The Greek version of MCPES is established as a reliable measuring instrument of the climate of motivation in the field of primary education in Greece.

b. Gender is a differentiation factor of the climate of motivation with, male students obtaining scores higher in ego involving and autonomy and female students performing better in a task involving and relatedness.

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A Study of Academic Factors Underlying First Grade Retention in Primary Schools of North Khorasan

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Abstract

The first grade is the cornerstone of the student's education in school. Achievements at this grade wield huge influence on a child's interest and development of a positive attitude towards education and learning environment. The purpose of this study is to investigate the academic factors of first grade retention in primary schools in North Khorasan. In the first study, a causal-comparative method and in the second study, a qualitative method are adopted. The statistical population includes all first-grade students, their teachers, and parents in North Khorasan province. The first study' sample consists of 351 students who were divided into three groups of grade retention, weak academic achievement, and strong academic achievement. The second study consisted of 30 first-grade teachers. Data collection tools included Parental Involvement in the Child's Education Scale, Student-Teacher Relationship Scale, Researcher-Made Questionnaire, and semi-structured interview. The results showed that the parents of students with grade retention and poor academic achievement had limited participation in school activities. Teachers also had more conflicting relationships with weak students that were retained. According to the results of the qualitative method, three components of attitude, cognition, and behaviour in the teaching process served as qualitative subcomponents of difference between teachers of retained students and teachers whose students were not retained. The results have many implications for the prevention and reduction of grade retention, especially in the first grade.

Keywords: Grade Retention, First Grade, Academic Factors

Introduction

Grade retention refers to compelling s student to stay in the same grade for another academic year (Jackson, 1975). Grade retention is a popular yet controversial method for compensating for poor academic performance (McCoy & Reynolds, 1999). Some teachers and parents believe that by spending more than one year at the same grade, children are encouraged to acquire skills required to succeed at the next level (Jimerson & Kaufman, 2003). For children who are obliged to repeat a grade on the account of immaturity, it is reasonable to assume that spending time with younger peers and lower expectations would contribute to the child's social and personal adjustment. The purpose of grade retention is to amend academic failure or social immaturity. Many teachers who advocate grade retention practice argue that it is an effective solution to academic failure or incompatibility (Jimerson, Carlson, Rotert, Egeland, &Sroufe, 1997). It is estimated that approximately 7 to 15 percent of US students go through grade retention every year (Davoudzadeh, McTernan, & Grimm, 2015). In North Khorasan, in 2018 school year, the rate of grade retention was estimated at 5.25% at the first grade (North Khorasan Department of Education, 2018). In their study on a large sample of children aged 7 to 17-years old, Byrd and Weitzman (1994) found that 7.6% of children fail to pass the first or preschool grade.

Studies on the efficacy of grade retention have shown conflicting results regarding its effect on modifying children's socio-emotional needs and academic achievement. Some studies have found that grade retention improves children's academic performance at the next grade (Hughes, Chen, Thoemmes, & Kwok, 2010; Vandecandelaere, Vansteelandt, De Fraine, &Van Damme, 2016). According to some review and meta-analyses, the existing evidence does not support the use of grade retention as an academic intervention (Holmes, 1989; Jackson, 1975). On the other hand, some studies have not presented any evidence of the beneficial effects of grade retention (Holmes, 1989; Holmes & Matthews, 1984; Im, Hughes, Kwok, Puckett, & Cerda, 2013). Grade retention is associated with repeated absences, academic failure, and school dropouts (Andrew, 2014; Ou & Reynolds, 2010). In a longitudinal study, Hughes, Coa, West, Smith, and Cerda (2017) examined the effects of grade retention at primary school on early dropout at age of 16, finding that grade retention escalates early dropout and this effect persisted even after controlling the covariance related to academic achievement. Some studies have found that retained children have lower school attendance, poor social adjustment, negative attitudes toward school, behavioural problems, and poor academic achievement compared to their peers. However, other studies have reported less differences between these two groups (Jimerson & Kaufman, 2003; Jimerson & Ferguson, 2007). Some studies looked into the role of grade moderator in personal and social adjustment, suggesting that grade retention in the first year is less likely to be associated with adverse effects in subsequent years (Jimerson et al., 1997).

Considering the grave consequences of grade retention, it is necessary to identify the factors influencing grade retention. Yang, Chen, Rhodes, and Orooji (2018), focusing on the variables of financial problems and lack of parental participation in school activities, conducted a longitudinal study on the risk factors of grade retention among primary students, reporting a correlation between grade retention and financial problems. The found that the relationship between grade retention and financial problems is moderated by the variable of participation in school activities. It has been found that parental involvement in school activities is particularly critical in the early years. However, a large number of studies have reported a significant relationship between parental involvement in school activities and test scores (Winsler, Hutchison,

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De Feyter, Manfra, Bleiker, Hartman, & Levitt, 2012). According to these studies, poor parental involvement in school activities is associated with grade retention (Anderson, Whipple, & Jimerson, 2003; Jimerson et al., 1997; Byrd & Weitzman, 1994; Holt & Garcia, 2005). Another study reported that retained children are more likely to display poor readiness skills in preschool (e.g., Duncan et al., 2007; Huang, 2014; Davoudzadeh et al., 2015).

Parents, teachers, and principals play a vital role in the decision-making process of grade retention. A student's behaviour is believed to influence teacher's evaluation of his / her performance (Pianta & Steinberg, 1992). Children labelled as challenging by their teachers in the early years of school are at a greater risk of encountering problems throughout the curriculum (Flanagan et al., 2003). Teacher-student conflict is a strong predictor in children' acting out, and negative interactions of teachers and children may propose a higher risk of academic failure. On the other hand, positive educational and emotional experiences at school may help reduce children's risky behaviours (Hamre & Pianta, 2005; Ladd & Burgess, 2001). For children that are likely to face school problems, the school-based approach of Noam and Herman (2002) emphasizes the importance of establishing early relationships with the teacher. It posits that such relationships provide resources and resilience mechanisms to cope with the effects of problems and conflicts in family relationships. There is a great deal of evidence that teacher-child interactions are valuable to student's performance when these interactions are focused, direct, and intentional, and feedback is provided on the student's performance (Dolezal, Welsh, Pressley, & Vincent, 2003; Pianta, La Paro, Payne, Cox, & Bradley, 2002; Torgesen, 2002). Pianta et al. (2002) found that when teachers nurture a more child-centred atmosphere, pre-schoolers' children are more likely to engage in learning tasks. The student's perception of positive attachment to the teacher is a predictor of their greater engagement in the curriculum (Furrer & Skinner, 2003), higher academic motivation (Roeser, Eccles, & Sameroff, 2000), and greater academic achievement (Crosnoe, Johnson, & Elder, 2004; Gregory & Weinstein, 2004). Perry, Donohue and Weinstein (2007) demonstrated that, if students' individual characteristics are controlled, in teachers who provide students with more academic, emotional and social support such as showing interest to students' hobbies and providing challengeable opportunities for learning and positive social relationships, students score higher grades in math and have a more positive perception of educational activities. In general, most studies on grade retention suffer from methodological problems, for example, (a) comparing pre-test and post-test outcomes of students with grade retention rather than using a comparison group; b) failing to present the characteristics of comparison groups (Holmes, 1989; Niklason, 1987; Jimerson et al., 1997). The present study aims to identify academic factors involved in grade retention using comparative groups (students with low and high academic achievement) to overcome the methodological limitations of past studies, thereby provided more reliable results on factors influencing grade retention in the first grade.

Given the adverse consequences of grade retention on students' academic motivation and its financial costs, the educational system needs to investigate educational factors influencing grade retention. Identifying academic factors influencing grade retention can provide strategies to diminish this practice. This paper investigates the factors affecting grade retention in forms of two studies. The first study examines the role of parental involvement in school activities, pre-school education, and teacher-student relationships at the first grade retention, and the second study explores the role of teachers' educational processes in grade retention from a qualitative perspective

Study 1

Method

We used a causal-comparative method because retained students were compared with their peers who had poor and strong academic achievement.

Sample and Sampling Method

The study population consisted of all first-grade students studying at the primary schools of North Khorasan Province in 2018-2019 school year (approximately 17,000 students). According to the North Khorasan Department of Education, there are 894 cases of first grade retention in this province. We used the maximum sample size (n = 386) and 351 completed data forms were retrieved. In the first part, 128 retained students were randomly selected from different cities of the province. For each of these students, some of their peers with weak and strong academic achievement were randomly selected from the same class. The sample size of each peer group was n = 128. After data collection and exclusion of incomplete data, the data of 117 retained students, 117 weak students, and 117 strong students were achieved. Thus, the sample size consisted of 351 students.

Instruments

Researcher-made questionnaire

This questionnaire was used to collect demographic characteristics such as student gender and age, parental education level, parental occupation, and preschool education

Parental involvement in the child's education scale

For measuring the participation of parents in school activities, we used some items of Parental Involvement in the Child's Education Scale designed by Walker, Wilkins, Dallaire, Sandler, and Hoover-Dempsey (2005). Cronbach's alpha of this scale has been reported to be between .70 and .90. In the present study, the subscales of parental help and guidance in school assignments, parental knowledge and skills, and parental self-efficacy were used to measure participation in school activities. This questionnaire was translated, matched with the back-translation and a Cronbach's alpha reliability of .91 was obtained for the preliminary study.

Student-teacher relationship scale

This scale, designed by Koomen, Verschueren, van Schooten-Jak, and Pianta (2012), contains 28 items and has three subscales of dependency, close relationship, and conflict. The response scale is based on a 5-point Likert scale (1 = completely false to 5 = completely true). An internal consistency of .88, .90 and .78 has been reported for the three scales of the close relationship, conflict relation, and dependency, respectively. This questionnaire was translated for the present study, and a Cronbach's alpha of .84 was obtained in the preliminary study.

Procedure

To observe ethical considerations, an informed consent form was obtained from participants before starting the research. Participants were assured that their private information would not be disclosed to any organization or individual and they would remain anonymous. In this study, parents completed Parental Involvement in the Child's Education scale and demographic information questionnaire, and teachers completed the Teacher-Student Relationship Questionnaire. In this study, data analysis was performed using SPSS software. Given that

Table 1. *Mean and standard deviation of parental involvement in school activities by groups and group differences*

Parental Involvement Components	Group	Mean	Standard Deviation	Group differences		Mean Differences	ANOVA	
							f	*p*
Helping in assignments	Grade retention	22.94	12.72	Grade retention	Weak	3.79*	13.32	.0001
	weak	26.74	10.94		Strong	7.76*		
	strong	30.71	10.75	Weak	Strong	3.97*		
Acknowledge and skills of parents	Grade retention	31.27	9.78	Grade retention	Weak	1.89	38.97	.0001
	weak	33.16	7.82		Strong	8.86*		
	strong	40.13	6.33	Weak	Strong	6.97*		
Efficacy	Grade retention	24.85	5.36	Grade retention	Weak	.97	70.95	.0001
	weak	25.82	4.32		Strong	7.21*		
	strong	32.06	5.31	Weak	Strong	6.24*		

Table 2. *Comparison of frequency of pre-school education in different groups of students*

Variables	Responses	Groups			X^2	*p*
		Grade retention	Weak	Strong		
Preschool education	yes	65	79	96	19.05	.0001
	no	52	38	21		

Table 3. *Mean and standard deviation of teacher-student relationship components*

Teacher-Student Relationship Components	Group	Mean	Standard Deviation	Group differences		Mean Differences	ANOVA	
							f	*p*
Dependency	Grade retention	14.19	3.44	Grade retention	Weak	.11	.03	.97
	weak	14.30	3.92		Strong	.02		
	strong	14.23	3.86	Weak	Strong	.09		
Close Relationship	Grade retention	35.84	5.99	Grade retention	Weak	.29	17.48	.0001
	weak	36.13	5.58		Strong	4.10*		
	strong	39.94	6.19	Weak	Strong	3.18*		
Conflict	Grade retention	27.94	8.63	Grade retention	Weak	1.45	4.88	.001
	weak	26.49	8.97		Strong	3.78*		
	strong	24.16	10.33	Weak	Strong	2.33		

the present study was a causal-comparative study, one-way ANOVA and Chi-square were used to consider three groups and several dependent variables.

Results

Demographic characteristics: 62.7% (220) of participants were male and 37.3% (131) were female students. Most of participants lived in Bojnord (94), Raz and Jarglan (68), Mane and Samalqan (58), Esfarain (51), Shirvan (39), Bam and Safi Abad (27), Farooj (8), Garme (3) and Jajarm (3). 52.1% (183) of samples came from rural areas and 47.9% (168) from urban areas. The mean age of the students was 7.45 years with SD = .60. With regard to parental occupation, the fathers of 123 students were workers, 128 were self-employed, 27 had office job, 60 were farmers and ranchers, and 13 were unemployed. As for mothers, 330 were housewives and 6 were workers. In regard to parental education, 39 of fathers were illiterate, 140 had primary education, 85 had middle-school education, 64 had high-school education, and 23 had diploma. As for mothers, 56 were illiterate, 119 had primary education, 86 had middle-school education, 72 had high school education, and 18 had a diploma.

Table 1 presents the results of the One-Way Analysis of Variance to compare parental involvement components in three groups of weak, strong and retained students. Since there were three groups for comparison, we used the Tukey post hoc test to evaluate the inter-group difference, considering that this test is suitable for comparison of the same-size groups.

As shown in Table 1, in the parental participation variable, there is a significant difference between the three groups in subscale of parental assistance in doing homework so that the parents of retained students offered the lowest assistance and guidance and parents of the strong student group provided the greatest help and guidance. As for the subscale of knowledge and skill, the parents of retained students had the lowest knowledge and skill to aid their children. As for the self-efficacy subscale, parents of retained and weak students displaced lower self-efficacy in helping and participating in school activities compared to the strong group.

Table 2 shows the results of the Chi-square test for comparing the frequency of pre-school education in the groups.

Table 2 shows that the retained students experience pre-school education less than the other groups

Table 3 presents the results of One-Way Analysis of Variance test for comparing the components of student-teacher relationships in the groups of retained, weak, and strong students. Tukey post hoc test was used to demonstrate inter-group differences.

According to Table 3, in the teacher-student relationship variable, dependency was not significantly different be-

Table 4. *Attitude component of the teaching process in teachers with and without retained students*

Sub-components	Teachers with retained students	Teachers without retained students
Teaching children	Being disappointed in teaching students with learning disabilities and ignoring them; using labels that discourage them.	Love teaching and children, motivation and efforts to help children with learning disabilities
Content	The scattered content of the math book, the inconsistency of lines used in writing and reading books, the heavy and difficult content of the Quran course, and the final part the reading book	The use of both reading and Quran-based textbooks reinforces reading. When it comes to reading, the kind of book they read is not important.
Descriptive evaluation	Descriptive evaluation makes students lazy. Completing evaluation forms and work folders is useless and time-consuming.	Descriptive evaluation leads to a reduction in student stress and an accurate recognition of students' talents and weaknesses.

tween the three groups, but they were significant different with regard to close relationship and conflict so that retained and weak students had more conflict with teachers than did the strong group. The strong students managed to forge a close relationship with the teacher compared to the other two groups

Study 2

Method

In this study, a qualitative approach (the grounded theory method) was used to explore teaching methods employed by the teachers. The grounded theory is an inductive and exploratory method that allows researchers to formulate a new theory rather than rely on existing theories. Systematically formulated based on actual data, this theory is applicable in cases where our knowledge is limited.

Sample and Sampling Method

The statistical population consisted of all first-grade teachers in Bojnord in 2018-2019 school year. Given the qualitative and the effort to gain rich and in-depth insights into participants' experiences, a limited sample size was selected and sampling was continued until the theoretical saturation was reached. Using purposeful sampling, 30 first-grade teachers were selected. Of these teachers, 20 had retained students in their classes but there were no retained students in the class of other 10 teachers. Data collection continued to reach theoretical saturation.

Instrument

Semi-structured interviews for teacher evaluation of teaching practices

Given the absence of any standardized questionnaire for the evaluation of teaching practices in the first grade and considering that the use of self-report multiple-choice questionnaires risks biased responses, semi-structured interviews were used for collecting. The interview involved asking questions about the teaching strategies used by teachers to instruct first-grade students. The open-ended questions allowed in-depth assessment of experience, practice, or action processes. Questions were developed according to the results of previous studies on academic factors influencing academic achievement. Most of questions were about teaching methods, teaching tools, motivation strategies, curiosity- arousing methods, creation of positive attitudes and attractive learning environments, evaluation goals, evaluation methods, types of homework, helping of weak students, and classroom management.

Procedure

After theoretical saturation was reached, the data derived from notes taken during the interviews were coded. Initially we used free coding to assign appropriate codes to various sections of the data, and the data were then categorized into sub-components. The axial coding was used to detect connection between sub-components and data was further decomposed into components. The ethical considerations observed in qualitative research are also applicable to the grounded theory method, including anonymous data collection and confidentiality of the participant's data and non-disclosure of their identity.

Results

At the end of data collection, all interviews were transcribed, and divided into two separate groups of teachers with retained students and teachers without any retained students. Based on axial coding, three components of attitude, cognition, and behaviour, and based on free coding, sub-components for teaching processes were obtained. The attitude component consisted of sub-components of children's education and descriptive evaluation. The component of cognition, subcomponents consisted of knowledge of children teaching methods, teaching aids, evaluation methods, and helping of weak students. The behavioural comprised sub-components of teaching methods, strategies to motivate students, create a positive attitude in students and stimulate their curiosity as well as the amount and type of assignments, and classroom management. Tables 4 to 6 illustrate the differences between teachers with and without retained students in terms of attitude, cognition and behaviour components of teaching processes.

As shown in Table 4, teachers with retained students in their class grow tired of working with students with learning problems, tend to ignore them by labelling, and make no effort to improve their skills. These teachers hold a negative attitude toward the descriptive evaluation system and completion of educational forms and work folders. On the other hand, teachers without retained students in their class maintain a positive attitude of educational content and the descriptive evaluation system.

Table 5 shows that teachers without retained students have a good command of teaching methods. They always seek to stay updated of the latest advancements in child psychology and teaching practices and never come to class without preparation. They have creative ideas for teaching and designing teaching instruments. They are cognizant of a variety of assessment methods such as self-assessment, peer-assessment, parental and performance assessment. as for weak students, they have sufficient knowledge to identify students' weaknesses and help them overcome these frailties.

Table 6 shows that teachers of retained student often prefer to use more traditional teaching methods, sometimes students are more active in some stages of instruction such as reviewing the lessons and teachers utilize more readily available teaching materials.

On the other hand, teachers without retained students opt for creative and heuristic teaching approaches, and design creatively teaching materials with a student-centred teaching method. They place premium on close relationships with stu-

Table 5. *Cognitive component of the teaching process in teachers with and without retained students in their class*

Sub-components	Teachers with retained students	Teachers without retained students
Knowledge of children	Lacking or having inadequate knowledge of child psychology, paying little attention to students' knowledge	Good knowledge of children and motivation to stay up-to-date, understanding students and discovering their special talents or weaknesses
Knowledge of Teaching practices	Knowledge Insufficient Teaching Practices and Incomplete knowledge of New Teaching methods	Tendency to prepare themselves for a new teaching method a few days ahead, thorough study of new teaching methods in the first grade
Knowledge of teaching instruments	Use of playing cards, newspapers, books, tablets, all tangible objects, consonant-vowels, poetry	Structuring creative educational instruments based on teacher guides, use of games, poetry storytelling, display, tangible and accessible objects
Knowledge of Evaluation Practices	Use of Q&A, dictation, reading, observation, workgroups	Use of self-assessment, peer assessment, parental evaluation at home, functional evaluation, observations
Knowledge of students' weaknesses	Giving assignments and drills to be repeated and practiced, communicating with parents and using them in the class, teamwork, giving simple assignments, re-teaching, providing hands-on exercises	Identifying student's weaknesses, partnering, and working with parents to help students, referring weak students to the Centre for Learning Disability, giving specific assignments to students, consulting with a physician and counsellor for specific strategies

Table 6. *Cognitive component of the teaching process in teachers with and without retained students in their class*

Sub-components	Teachers with retained students	Teachers without retained students
Teaching methods	Traditional, integrative, teacher-centred, creative	Integrated and sstudent-centred methods
Creating a positive attitude in students	Encouraging, building confidence, giving responsibility	Making students interested in the learning environment, participatory learning, discussing learned things, enhancing students' self-confidence by encouraging and reassuring, excluding unhealthy competition
Stimulating students' curiosity	Developing craftsmanship, storytelling, Q&A, play and poetry, assigning challengeable tasks	Paying attention to teacher-student relationship, using storytelling, drama, Q&A
Motivating Students	Speaking, encouraging and giving Stars, teamwork, designing specific tasks for learning every letter, taking responsibility, poetry and playing	Storytelling, motivating students to learn a specific subject, encouraging, sharing teaching responsibility, displaying love and affection, using food and supplies during teaching
The amount and type of assignments	Giving specific assignments in the book and supplementary pages, assigning homework relative to the child's ability level, giving targeted and skill-based assignments, dictation, wording, functional assignments for math homework	Considering student abilities and rate of learning assignments, using functional and practical assignments, giving hand-drawn assignments
Classroom management	Setting of classroom rules, group activities, and participatory sport gestures, motion games, practising silence, putting the name, granting responsibility, encouragement, behaviour, and respectful behaviour of the teacher	Preparation before the class, benefiting from student participation in class, establishing order, silence practice, slow talk, poetry reading, and touching

dents to stimulate a sense of curiosity, motivate students and construct an interesting learning environment. They do not set strict rules in the classroom and prefer functional assignments. Teachers without retained students try to make students more interested in learning and eliminate unhealthy competition in the classroom.

Discussion and conclusion

The purpose of this research was to investigate the educational causes of first grade retention in primary schools of North Khorasan. The results of the first study showed that in the parental involvement variable, there was a significant difference between the three groups in terms of parental help and guidance for homework, so that the parents of students in the grade retention group offered the lowest level of help and guidance, knowledge, skill, and self-efficacy to help their children. Studies suggest that greater parental involvement in educational activities is associated with lower risk of grade retention (Holt & Garcia, 2005). Studies have also suggested that poor parental involvement in school activities is linked to grade retention (Anderson et al., 2003; Jimerson et al., 1997; Byrd, & Weitzman, 1994). It has been shown that parental involvement in school activities is particularly critical in the early schooling years. However, the bulk of studies have reflected the significant relationship between parental involvement in school activities and academic achievement (Winsler et al., 2012).

Given that in this study the parents of weak and retained students came from a low socioeconomic background, this could reduce the extent of student participation at school. That is, researchers found that patterns of student involvement in school were related to socioeconomic background of the family (Ashiabi, 2005; Garcia & Guerra, 2004). In the absence of sufficient economic resources, children struggle with a host of challenges like emotional well-being, health, and cognitive development, which may negatively impact school engagement. Families in the grip of financial problems usually have limited resources and greater stress, which takes a toll on the time and attention allocated to educational needs of children. Material problems such as inappropriate studying environments, lack of proper transportation or school uniforms as well as nutrition can de-

crease the levels of school involvement, which in turn has a bearing on academic performance and grade retention. Studies have shown that students with poor socioeconomic status are more likely to skip school (Morrissey, Hutchison, &Winsler, 2014), and display undesirable academic performance (Dearing, McCartney, & Taylor, 2011).

The results of this study showed that retained students barely attended any preschool program. It has been shown that poor pre-school preparation skills are a predictor of grade retention (Shiralipour, Asadi, Nazari, & Shakuri, 2013; Duncan et al., 2007; Huang, 2014; Davoudzadeh et al., 2015). In this regard, Wang and Johnston (1997) examined the effectiveness of a preschool program by comparing three groups of students: those who had enrolled in preschool, students who had not participated in any preschool program and students who failed the first grade. They found that the preschool program was effective, because the training provide in the preschools developed children's experiences. This in turn enhanced cognitive and social functioning and improved children's preparedness and enthusiasm for school, early academic success, and school skills acquisition. Various studies have demonstrated the positive impact of preschool program and preparation courses on students' performance and academic achievement at school (Shiralipour, Asadi, Nazari, & Shakuri, 2013). First grade is a student's first experience of academic environment, and the teacher had an enormous effect on shaping students' attitude. According to the results of the present study, in the teacher-student relationship variable, the component of dependency was not statistically different between the three groups, but they were significantly different in the component of close relationship and conflict between, so that retained and weak students were significantly different from the strong students. Retained and week students were in conflict with the teacher while strong students managed to forge a close relationship with the teacher compared to the other two groups.

Consistent with the present study, Ari, Tunçer, and Demir (2016) reported that successful teachers build close relationships with the students. Hamre and Pianta (2005) found that students at the risk of academic failure, who receive teacher's emotional and educational support, displayed better academic achievement and improved teacher-student relationships. Students who form a warm and intimate relationship with their teachers are more motivated to learn, have a greater self-confidence, and take interest in their teacher (Andrzejewski, & Davis, 2008). Social bonding with teachers is negatively associated with grade retention and school dropout (Catalano, Haggerty, Oesterle, Fleming, & Hawkins, 2004). Teacher's caring behaviour has been shown to promote prosocial beliefs in students and motivate them to engage actively in the class (Wentzel &Wigfield, 1998). Developing prosocial connections with adults at school can exert social control, thereby encourage positive behaviours and punish negative conducts (Catalano et al., 2004).

Based on the school-based approach of Noam and Herman (2002), which emphasizes the importance of building early relationships with teachers for children prone to educational problems, appropriate teacher-student relations act as a source of resilience, enabling them to cope with problems in family relationships. Studies suggest that positive school-based educational and social experiences help reduce the risk of behavioural problems, while adverse interactions teacher-children between may take a toll on children at high risk of educational failure (Hamre &Pianta, 2001; Ladd & Burgess, 2001). In line with the present study, Perry et al. (2007) revealed that students of teachers who provide more emotional and social support to students (e.g., pay attention to their interests, provide challenging learning opportunities and positive social relationships, etc.), score higher grades in math and hold a more positive attitude toward educational activities. As for the qualitative results obtained from the second study, three components of attitude, cognition, and behaviours were derived from axial coding and subcomponents of teaching processes was achieved from free coding. The sub–components of attitude consisted of children's education content and descriptive evaluation. In the cognitive component, subcomponents consisted of knowledge of children teaching methods, teaching aids, evaluation methods of weak students. The behavioural component comprised subcomponents of teaching methods, students' motivation, creation of a positive attitude in students, stimulation of curiosity, the amount and type of assignments, and classroom management.

Consistent with the study of Salsabili and Ghasemi (2005), teachers of retained students in the present study stated that the content of textbooks was scattered and difficult for some students to understand. Also, since they have limited time to teach, they have trouble following the materials specified in the book. Teachers of retained students hold a negative attitude towards the descriptive evaluation system due to their lack of knowledge of descriptive evaluation. They believe that filling out educational forms and work folders as time-consuming and futile, arguing that descriptive assessment makes students lazy. They point that the parents of poor students are less likely to cooperate with them. Moreover, teachers of retained students prefer to use traditional teaching methods and are reluctant to identify the flaws of their teaching or use more effective teaching methods. Since teachers of retained students are less student-centred, this can affect student engagement in homework and academic performance, making them less active during teaching. In this regard, studies reveal that students not involved in learning and classroom environments are less likely to progress at school and more susceptible to dropout (Henry, Knight, & Thornberry, 2102; Rhodes, 2011). Research has shown that school involvement affects academic achievement (Galla, Wood, Tsukayama, Har, Chiu, & Langer, 2014; Wang & Holcombe, 2010).

Also, the present study showed that teachers without retained students maintain a positive attitude towards educational content and descriptive evaluation system. They believe that the descriptive evaluation system allows accurate recognition of students and reduces score stress. To them, filling out educational forms and folder work is not useless and waste of time. They are eager to learn and seek to update their knowledge on child psychology and teaching practices, prepare themselves before class, come up with creative teaching ideas and apply them in the class. These teachers work on reading and writing skills of first-grade students and strive to foster creativity and talents of their students. Their students interact well with parents and are they opt for a student-centred approach to teaching and class management. Similarly, Pianta et al. (2002) found that when teachers build a more student-centred atmosphere, pre-schoolers are more likely to engage in learning tasks. The perception of positive dependence on teachers by students is a predictor of engagement with the curriculum (Furrer & Skinner, 2003), enhanced academic motivation (Roeser et al., 2000) and greater academic achievement (Crosnoe et al., 2004; Gregory & Weinstein, 2004). According to Reeve's (2012) approach, student-centred teachers promote the learning environment and encourage students to be actively involved in learning. Research suggests that school involvement is a strong predictor of academic outcomes in both cross-sectional and longitudinal studies (e.g. Li-Grining, Votruba-Drzal, Maldonado-Carreno, & Haas, 2010). Most importantly, teachers without retained students enjoy spending time with first-grade students. These teachers usually employ creative and heuristic teaching methods, and prefer making use of creatively designed teaching aids. To stimulate a sense of curiosity and motivation and to stress the importance of building close relationships with students, they do not set strict rules for the classroom and adopt functional assignments and environmentally relevant assignments. They attempt to make students more interested in learning and diminish unhealthy competition in the classroom. They recruit a variety of evaluation methods such as self-assessment, peer-assessment, pa-

rental and performance assessment. As for weak students, teachers try to identify their weaknesses and if they fail to help a student, he/she would be referred to a training centre or experts for consultation, and they avoid sticking labels to these students. Therefore, students of teachers who provide more education, emotional and social support to students often gain higher scores, and develop more positive attitudes toward educational activities (Perry et al., 2007).

It seems that teachers without retained students employ more effective teaching methods. The following are characteristic of effective teachers: they spend more time for teaching first grade students and utilize different teaching strategies. They tend to adjust the teaching style to suit the whole class, small groups, and individual students. They do not suffice to explaining and modelling but also monitor the progress of students to see how students apply the learned acknowledge and help them if needed. Moreover, effective teachers often use positive motivation. They use various points for teaching to support students' academic motivation (for example, they give reward to successful students, giving them the impression that their success is the outcome of the their own efforts), tailor assignments to students' abilities and forge a link between learning materials. Finally, effective teachers are good at classroom management, rarely use strict disciplinary rules, the class program flows smoothly so that an observer can barely understand the classroom management plan (Bohn, Roehrig, & Pressley, 2004; Ari et al., 2016).

Given the low parental involvement in school activities of weak and retained students, it is advised to hold meetings with these parents to promote their collaboration with teachers and school principals as a way of advancing the children's education. Given the impact of pre-school education on grade retention, it is recommended to make pre-school programs compulsory for all students and the performance of preschool centres should be monitored for teaching preparation skills. It is necessary to boost teachers' acknowledge of the descriptive evaluation and effective and creative teaching practices and teachers' evaluation should be based on their acknowledge and application of these ways. It is recommended to identify vulnerable children-children with family and financial problems, slow learning, learning disorders, emotional-behavioural problems- in the first months of school year to provide prompt interventions and to prevent grade retention. When selecting and recruiting teachers, especially for the first grade, the willingness and interest in working with children, patience, teaching passion and sufficient knowledge of children, as well as the adoption of effective teaching methods should be taken into account.

This study, like other research papers, had some limitations. Using self-report tools for parent and teacher may lead to biased responses. A standardized questionnaire was not available for examining teachers' teaching style in the first grade, and the use of other teaching questionnaires caused bias in response. Although the causal-comparative method was used to obtain causal results, it was not included in the experimental designs, and therefore the underlying causes of grade retention might not be accurate. The present study was conducted in the primary schools of North Khorasan Province, so caution should be exercised in generalizing the findings. Given the limitations of the study, it is suggested to assess students for individual characteristics at the beginning of each school year, and monitor teaching methods regularly during and at the end of each school year. It is also recommended to draw a comparison between retained students and successful students. Future studies can explore the causes of grade retention and dropout.

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Investigation of the Relationship Between Self-Efficacy Belief and Classroom Management Skills of Preschool Teachers with Other Variables

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Abstract

This study aimed to determine preschool teachers' self-efficacy belief levels and their classroom management skills and to examine the relationship existing between them. The research, which was designed according to the correlational survey model, was conducted on 274 preschool teachers. Descriptive statistics, inferential statistics, and correlational statistics were used to analyze the data collected via the "Self-Efficacy Belief Scale of Pre-Service Teachers" and "Classroom Management Skills Scale for Pre-Service Teachers". The findings of the study revealed that preschool teachers' self-efficacy belief levels and classroom management skills were high, and affected by teachers' age, seniority, type of school, and the number of children in the class. In addition, the findings of the study revealed that there were positive, moderate, and strong relationships between preschool teachers' self-efficacy and professional skills and classroom management skills. The moderate positive relationship between teachers' self-efficacy belief and classroom management skills showed that the qualities achieved in these two areas affected each other.

Keywords: Preschool Teacher, Self-Efficacy Belief, Classroom Management Skills

Introduction

Self-efficacy belief appears to be the main factor in determining the causes of an individual's behavior and the changes in his/her behavior (Henson, 2001; Gençtürk, 2008). As a concept, self-efficacy belief was expressed by Bandura (1977) within the "social learning theory" as "the belief that individuals can plan, organize, and execute the actions that they need to perform a certain performance". Teachers' existing capacities that can be used in the learning process of the pupils and their belief about the sufficiency of these capacities constitute teachers' self-efficacy belief (Babaoğlan & Korkut, 2010; Tschannen-Moran & Woolfolk-Hoy, 2001). The knowledge, skills, and attitudes of teachers play an important role in these beliefs (Demirtaş, Cömert, & Özer, 2011; Gokmen et al., 2016). In this context, self-efficacy belief is also the source of personal development and change that will enable the teacher to have the necessary qualities (Gömleksiz & Serhatlıoğlu, 2013). Concurrently, self-efficacy belief level is effective in increasing motivation (Shunk, 1991) and in achieving success (Yılmaz, Tomris, & Kurt, 2016). Therefore, self-efficacy belief level will be effective on the negative or positive attitudes of the individual towards a certain field (Şenol & Ergün, 2015).

Educational practices, the processes of organizing classroom environment and creating a classroom atmosphere, may differ by teachers' self-efficacy belief levels. (Gibson & Dembo, 1984; Şenol & Ergün, 2015; Yılmaz, Gerçek, Köseoğlu, & Soran, 2006). Teachers' self-efficacy belief has a significant impact on the development and application of different solution strategies in identifying and solving problems in the educational environment. Therefore, teachers' self-efficacy belief ensures that they perceive themselves as sufficient (Özdemir, 2008; Üstüner, Demirtaş, Cömert, & Özer, 2009). A low self-efficacy belief level causes a decrease in pupils' learning levels due to teachers' occupational burnout (O'Neill & Stephenson, 2011), whereas teachers with high self-efficacy belief levels appear to affect the academic achievement of the pupils (Goddard & Goddard, 2001; Gömleksiz & Serhatlioglu, 2013; Senol & Ergun, 2015; Tschannen-Moran & Woolfolk-Hoy, 2001), their motivation, and self-efficacy belief (Babaoğlan & Korkut, 2010; Gökmen et al., 2016; Üstüner et al., 2009) along with professional achievement. In other words, teachers increase children motivation towards learning and help them to develop positive attitudes towards themselves (Midgley-Feldlaufer & Eccles, 1989). Studies conducted to investigate teachers' self-efficacy and its effects showed that a positive classroom atmosphere has a positive effect on children (Goddard & Goddard, 2001; Üstüner et al., 2009). In a study conducted on 135 children receiving preschool education, Justice, Mashburn, Hamre, and Pianta (2008) concluded that there is a positive relationship between teacher self-efficacy and children's literacy skills. This can be explained with the fact that teachers with high self-efficacy belief levels have a more humanistic approach towards children and with their development in planning and organizing child-centered learning activities (Goddard & Goddard, 2001; Guo, Shayne, Piasta, Laura, Justice, & Kaderavek, 2010; Woolfolk-Hoy & Hoy, 1990).

When compared, teachers with strong self-efficacy perceptions tend to use more organized and better-planned class strategies than those with low self-efficacy belief levels (Goddary, Hoy, & Woolfolk, 2000). Therefore, there is a correlation between teachers' self-efficacy belief and classroom management skills (Woolfolk-Hoy & Hoy, 1990). In addition to their self-efficacy belief, teachers should have the ability to exhibit classroom management skills with which they can organize the educational environment (Öztürk, 2002; Jacobson, 2003; Denizel-Güven & Cevher, 2005; Getting & Kohler, 2006). Classroom management is the establishment of a motivational and participatory classroom environment for ensuring the learning of children at the highest level (Sadık & Dikici-Sığırtmaç, 2016). In other words, classroom management includes the methods and practices used to create a learning environment targeting children's behavior and thinking (Marzano, 2003). The good use of classroom management skill by the teacher has a positive effect on children's behaviors and achievements, and decreases children's unwanted

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behaviors (Akgün, Yarar, & Dinçer, 2011; Aküzüm & Altunhan, 2017; Meehan, Cowley, Schumacher, Hauser, & Croom, 2003; Miller, 2003; Oliver, Wehby, & Reschly, 2011; Özdemir, 2004; Pianta, 1997; Sucuoğlu, 2008). In order for the teacher to be a good class manager, he/she should possess the knowledge of effective teaching and interventional strategies, as well as the ability to decide the appropriate action and develop new strategies when necessary (Açıkgöz, 2003). This is possible by improving the teachers' knowledge and skills in classroom management (Duman, 2008). Research showed that teachers' competencies had a significant effect on classroom management (Piwowar, Thiel, & Ophardt, 2013; Degol & Bachman, 2015; Denizel-Güven & Cevher, 2005). In their study involving teachers' classroom management skills, Marzano, Marzano, and Pickering (2003) concluded that teachers' behaviors were more influential on the achievement of children than other factors, such as curriculum and school policies. Teachers who use effective classroom management strategies in the classroom have been observed to increase the pupils' self-esteem and achievement levels and to easily solve disciplinary problems (Meehan et al., 2003). In other words, during the preschool period when children are in the educational environment for the first time and begin to develop their perception of the school, the classroom management skills of the teachers have a significant effect on children's learning (Jacobson, 2003; Sadık & Dikici-Sığırtmaç, 2016). In addition, the classroom management skills of teachers in preschool educational institutions where children with special needs have been included in mainstream education since 2009, is becoming more important (Başal, 2005).

The level of classroom management is affected by the attitudes and belief of teachers and children (Kagan, 1992). In addition, teachers' self-efficacy belief levels affect their efforts in the teaching process and their achievement of educational objectives (Henson, 2001; Tschannen-Moran & Woolfolk-Hoy, 2001). Lorsbach and Jinks (1999) concluded that teachers with high self-efficacy belief levels possess better time management skills, which is one of the classroom management strategies. Büyükduman (2006) reported that self-efficacy belief has a significant effect on the ability to create a conducive educational environment, which is considered one of the classroom management skills. Woolfolk-Hoy (2000) stated that possessing a high self-efficacy belief level leads teachers to be more willing to practice and be more loyal to the profession. Similarly, studies revealed that there is a relationship between teacher self-efficacy belief and classroom management skills (Woolfolk-Hoy & Hoy, 1990; Savran & Çakıroğlu, 2003). Success in education is possible with the success of teachers. This success can be achieved by ensuring that teachers have high self-efficacy belief levels about their duties and responsibilities (Yılmaz, Köseoğlu, Gerçek, & Soran, 2004). In this regard, considering the effect of teachers on the educational process, it is important to analyze teachers' self-efficacy belief and classroom management skills and the factors affecting these beliefs and skills.

Previous studies examined teachers' self-efficacy belief levels by some variables (Guo et al., 2010; Gömleksiz & Serhatlıoğlu, 2013; Kadim, 2013; Şenol & Ergün, 2015; Yılmaz et al., 2016; Gökmen et al., 2016). Similarly, some studies revealed that many variables affected the classroom management skills of preschool teachers (Filcheck, Mcneil, Greco, & Bernard, 2004; Denizel Guven & Cevher, 2005; Gezgin, 2009; Tal, 2010; Akgün et al., 2011; Carlson, Tiret, Bender, & Benson, 2011; Nur, 2012; Yeşilay Daşıran, 2013; Keles, 2013; Degol & Bachman, 2015; Dinçer & Akgün 2015; Adıgüzel, 2016; Toran & Gençgel Akkuş, 2016; Zembat, Tunçeli, & Akşin Yavuz, 2017; Sadık & Dikici Sığırtmaç, 2016; Aküzüm & Altunhan, 2017; Metin, Aydoğan, Kavak, & Mercan, 2017; Ekici, Günhan, & Anılan, 2017; Şahin-Sak, Sak, & Tezel-Şahin, 2018).

Regarding the studies conducted in Turkey, only one study investigated the relationship between preschool teachers' self-efficacy belief levels and classroom management perception levels (Toran, 2019). It is thought that determining the relationship between self-efficacy belief and classroom management skill perception of preschool teachers will fill the gap in the field and contribute to the teacher training programs to increase the quality of preschool teachers.

Purpose of the Study

The main purpose of this study was to analyze the relationship between preschool teachers' classroom management skills and self-efficacy belief levels. The following questions were addressed within this framework:

1. What is the level of classroom management skills and self-efficacy belief of preschool teachers?

2. Do the classroom management skills and self-efficacy belief of preschool teachers differ by their demographic characteristics (age, education level, seniority, type of school, and the number of children in the class)?

3. Is there a relationship between the self-efficacy belief of preschool teachers and their classroom management skills (professional skills and teacher-child interaction)?

Method

This quantitative study was conducted using the correlational survey model. According to Karasar (2003, p. 81), "correlational survey model is a research model aiming to determine whether there is a relationship between two or more variables and/or the extent of the relationship".

Participations

The study population comprised 576 preschool teachers from the central districts of Eskişehir; 257 of them worked in Tepebaşı, whereas 319 worked in Odunpazarı. Using the stratified sampling technique, from purposive sampling methods, 275 teachers were chosen from the study population; the results obtained from 274 teachers were reported after the data analysis. In the selection of the sample, firstly, the equation stated by Büyüköztürk, Çakmak, Akgün, Karadeniz, and Demirel (2018) was used to select the sample size that represented the population; the minimum sample size representing 576 teachers with a 95% confidence interval was found to be 230. Afterward, kindergartens in primary schools and preschools in Tepebaşı and Odunpazarı were identified, and sampling was performed according to the weight of schools in the districts. In this way, it was ensured that the sample represented the population both quantitatively and qualitatively. The characteristics of the teachers are summarized in Table 1.

As shown in Table 1, 11 characteristics of 274 preschool teachers participating in the research were considered. Most, 98.9% (n = 271), of the preschool teachers were female, and 1.1% (n = 3) were male. As 12.4% (n = 34) of the teachers were under 30 years, 30.3% (n = 83) were 30-34 years old, 29.9% (n = 82) were 35-39 years old, and 27.4% (n = 75) were over 40 years. The distributions of the teachers according to seniority were checked and it was found that 11.3% (n = 31) had 0-5 years, 31.0% (n = 81) had 6-10 years, and 57.7% (n = 158) had at least 11 years of work experience. Of the 274 teachers whose opinions were taken within the scope of the study, 30.7% (n = 84) graduated from open education, whereas 69.3% (n = 190) graduated from formal education. The results depicted that majority of the teachers (93.1%; n = 255) had a bachelor's de-

Table 1. *Characteristics of the Teachers*

Demographic characteristics	Sub-categories	*N*	%	Overall
Gender	Female	271	98.9	274
	Male	3	1.1	
Age	Less than 30	34	12.4	274
	30-34 years old	83	30.3	
	35-39 years old	82	29.9	
	Over 40 years old	75	27.4	
Professional seniority	0-5 years	31	11.3	274
	6-10 years	81	31	
	11 years and more	158	57.7	
Type of school graduated from	Open education	84	30.7	274
	Formal education	190	69.3	
Education level	Under-graduate	14	4.4	274
	Graduate	255	93.1	
	Post-graduate	7	2.6	
Type of school	Kindergarten	108	39.4	274
	Preschool	166	60.6	
Age group of the children in the class	Three years old	13	4.7	274
	Four years old	67	24.5	
	Five years old	194	70.8	
Class size	15 or less	46	16.8	274
	16 or more	228	83.2	
Working time	Full-Day	270	98.5	274
	Half-Day	4	1.5	
Availability of an assistant staff	Available	136	49.6	274
	Not available	138	50.4	
Working status	Permanent	250	91.2	274
	Contracted / paid	24	8.8	

gree; 4.4% (*n* = 14) had an associate degree, and 2.6% (*n* = 7) had a master's degree. A total of 39.4% (*n* = 108) of teachers worked in primary schools, whereas 60.6% (*n* = 166) of teachers worked in preschool. Regarding the age groups of the children in their classrooms, 4.7% (*n* = 13) of the teachers had 3-year-old, 24.5% (*n* = 67) had 4-year-old, and 70.8% (*n* = 194) had 5-year-old children. Whereas 16.8% (*n* = 46) of the teachers had at most 15 children in their classroom, 83.2% (*n* = 228) had at least 16 children. The majority of teachers (98.5%; *n* = 270) were working half-day, whereas 1.5% (*n* = 4) were working full time. Concerning availability of assistant staff, 49.6% (*n* = 136) of the teachers stated that they had assistant, and 50.4% (*n* = 138) did not. Most, 91.2% (*n* = 250), of the teachers work permanently, and 8.8% (*n* = 24) of them work on contractual base or paid.

Data Collection Method

Demographic and Profession Information Form: It consists of the items prepared by the researcher to determine gender, age, seniority, education level, type of school graduated from, age group of children in their class, the number of children in their class, working time and status, and the availability of an assistant staff.

Classroom management skills scale for preschool teachers

The scale, which was developed by Dinçer and Akgün (2015) for evaluating classroom management skills of preschool teachers, is a 5-point Likert-type scale with 40 items. The scale has the following two sub-dimensions: teachers' professional skills and teacher-child interaction. The validity and reliability of the "Classroom Management Skills Scale for Preschool Teachers" were tested by applying it to 520 preschool teachers. As a result of the exploratory factor analysis, the factor loads related to the professional skills sub-dimension were found to be between .301 and .646, whereas factor loads of the teacher-child interaction sub-dimension were between .405 and .677. Accordingly, it was concluded that the scale met the accepted validity values (Dinçer & Akgün, 2015). The reliability of the answers given for the "Classroom Management Skills Scale for Preschool Teachers" were computed via test-retest and Cronbach's alpha coefficient, which was α = .88 for the professional skills sub-dimension, α = .70 for the teacher-child interaction sub-dimension, and α = .83 for the whole scale. Test-retest reliability coefficient was found to be *r* = .87 for the professional skills sub-dimension, *r* = .83 for teacher-child interaction sub-dimension, and *r* =.91 for the overall score, which showed that the scale met the reliability criteria (Dinçer & Akgün, 2015).

The scale was applied to 274 teachers to determine the classroom management skills of preschool teachers working in the central districts of Eskişehir. Cronbach's alpha coefficient was calculated to determine the reliability of the teachers' responses to the scale. The coefficient was found to be α = .929 for the professional skills dimension, α = .822 for the teacher-child interaction dimension, and α = .902 for the whole scale. The calculated values indicate that the responses of the preschool teachers to the scale items are reliable.

Table 2. *Descriptive Statistics*

Scale	Sub-dimension	*N*	Minimum	Maximum	Mean	*SD*	Item average
Self-efficacy belief scale		274	129.00	185.00	169.53	13.92	4.58
	Learning-teaching process	274	33.00	45.00	41.61	3.28	4.62
	Communication	274	24.00	35.00	32.21	2.74	4.60
	a	274	16.00	25.00	22.55	2.27	4.51
	Planning	274	20.00	30.00	27.34	2.62	4.56
	Organization of learning environments	274	18.00	25.00	22.99	2.01	4.60
	Classroom management	274	17.00	25.00	22.87	2.06	4.57
Classroom management skills scale		274	153.00	200.00	184.13	11.72	4.60
	Professional skills	274	115.00	155.00	143.30	10.35	4.62
	Teacher-child interaction	274	29.00	45.00	40.83	4.24	4.54

Self-efficacy belief scale of preschool teachers

The "Self-Efficacy Belief Scale of Preschool Teachers" developed by Tepe and Demir (2012) is a 5-point Likert-type scale consisting of 37 items. Tepe and Demir (2012) applied the scale to 862 preschool teachers for the validity and reliability study, and conducted exploratory factor analysis on the data. As a result of the analysis, it was found that the one-dimensional version of the 37-item scale explained 45.78% of the total variance, whereas the multi-dimensional version, formed by six factors, explained 65% of the total variance. The six factors in the scale were examined in terms of content; the first factor was named as "Learning-Teaching Process", the second factor "Communication Skills ", the third factor "Parental Involvement", the fourth factor "Planning", the fifth factor "Organization of Learning Environments", and the sixth factor "Class Management". Item factor loads varied between .54 and .71 in the first factor, .55 and .78 in the second factor, .70 and .80 in the third factor, .56 and .71 in the fourth factor, .57 and .68 in the fifth factor, and .45 and .69 in the sixth factor. Concurrently, confirmatory factor analysis was performed for single and multidimensional forms of the scale. The calculated model-fit values for the single dimensional form (X^2/sd) = 3.11, p = .00, comparative fit index (CFI) = .95, normed fit index (NFI) = .93, standardized root mean square residual (SRMR) = .34, root mean square error of approximation (RMSEA) = .05, goodness of fit index (GFI) = .92, adjusted goodness of fit index (AGFI) = .88 and multidimensional form chi-square / degree of freedom (X^2/sd) = 3.13, p = .00, CFI = .94, NFI = .92, SRMR = .52, RMSEA = .04, GFI = .92, AGFI = .90) also indicate that the models were validated. The reliability of the answers given by the teachers to the scale items was calculated using Cronbach's alpha coefficient and combined reliability coefficient (CRC). Alpha values were calculated as α = .91 for the learning-teaching process dimension, α = .90 for the communication dimension, α = .90 for the parental involvement dimension, α = .87 for the planning dimension, α = .88 for the organization of learning environments dimension, and α = .87 for the class management dimension. The combined reliability coefficient was found to vary between .95 and .97 (Tepe & Demir, 2012).

The reliability of the answers provided by the preschool teachers who participated in this study to the self-efficacy belief scale was also checked using Cronbach's alpha coefficient. As a result of the computations, alpha values were calculated as α = .843 for the learning-teaching process dimension, α = .816 for the communication dimension, α = .774 for the parental involvement dimension, α = .862 for the planning dimension, α = .764 for the organization of learning environments dimension, and α = .791 for the class management dimension. In other words, preschool teachers working in Eskişehir district centers provided reliable answers to the scale items.

Data Analysis

A total of 275 preschool teachers were contacted within the scope of the research. After the answers of the teachers were digitized, the data set was checked for missing values, but none was found. Then, the lowest-highest values were calculated, and incorrect data entries were corrected. After reviewing the data set, the overall and sub-dimension scores were calculated for each scale. The z-statistic of the scores was calculated, and an observation, showing three values, was excluded from the data set. Skewness and kurtosis coefficients for the remaining 274 teachers were calculated, and histogram graphs were drawn. Regarding the histogram graphs with coefficient values between -1 and +1, it was observed that the data sets did not start at 0 and were normally distributed. The skewness coefficient of teachers' self-efficacy total score was found to be -.587 with a kurtosis coefficient of -.691; skewness coefficient of teachers' class management score was found to be -.722 with a kurtosis coefficient of -.413. Similar coefficient calculations were performed for the sub-dimensions as well.

After determining the distribution of the data set, descriptive statistics were calculated for analyzing the data. Then, parametric and non-parametric tests were conducted according to the demographic characteristics of the teachers to verify if the data met the assumptions. The results were interpreted by taking level of significance (p) as .05. The Pearson correlation coefficient was also calculated to determine the relationship between teachers' self-efficacy and classroom management skills.

Findings

The findings obtained in this section are given in order of the research questions.

Findings About Classroom Management Skills and Self-Efficacy Belief Levels of Preschool Teachers

Descriptive statistics were calculated to determine the level of self-efficacy belief and classroom management skills of preschool teachers, and the results are shown in Table 2.

The review of Table 2 shows that the self-efficacy belief scores of the preschool teachers working in the central districts of Eskişehir varied between 129.00 and 185.00, and the average was calculated as 169.53 (± 13.92). It can be seen that teachers' classroom management skill scores varied between 153.00 and 200.00, and the average was calculated as 184.13 (± 11.72).

As the number of items in the scales and their sub-dimensions were different, each average was scaled in the range of 1 to 5 by proportioning the overall score to the number of items.

Table 3. *Difference Statistics of the Teachers According to Age*

Scale	Age	*N*	Mean	*SD*	Difference statistics	*p*
Self-efficacy belief	Less than 30	34	164.09	16.26	$X^2_{(3)}$ = 11.910*	.008
	30-34 years old	83	168.78	12.10		
	35-39 years old	82	169.38	14.38		
	Over 40 years old	75	172.99	13.48		
Classroom management skills	Less than 30	34	181.09	13.59	$F_{(3.273)}$ = 1.533**	.206
	30-34 years old	83	184.31	10.87		
	35-39 years old	82	183.45	12.01		
	Over 40 years old	75	186.04	11.29		

** Kruskal Wallis test, **One-way ANOVA test*

Table 4. *Difference Statistics of the Teachers According to Seniority*

Scale	Seniority	*N*	Mean	*SD*	Difference statistics	*p*
Self-efficacy belief	0-5 years	31	165.26	14.62	$F_{(2.273)}$ = 2.391*	.093
	6-10 years	85	168.61	13.38		
	11 + years	158	170.86	13.94		
Classroom management skills	0-5 years	31	181.97	12.04	$F_{(2.273)}$ = 1.167*	.313
	6-10 years	85	183.31	12.48		
	11 + years	158	184.99	11.22		

** (One-way ANOVA) test*

Table 5. *Difference Statistics of the Teachers According to the Type of School Graduated from*

Scale	Type of School	*N*	Mean	*SD*	Difference statistics	*p*
Self-efficacy belief	Open education	84	169.29	13.69	$t_{(272)}$ = .192	.848
	Formal education	190	169.64	14.05		
Classroom management skills	Open education	84	184.23	11.45	$t_{(272)}$ = .92	.927
	Formal education	194	184.08	11.87		

** Independent samples t-test*

For example, the average score (169.53) that teachers received from the self-efficacy scale was based on 37 items; thus, it was divided by 37; whereas the average of the teaching-learning process sub-dimension was divided by 9. Based on Tekin's (2002) "range/number of categories" equality, the average of 1-5 scale scores was interpreted as:

- Scores between 1.0 and 2.3 are low;
- Scores between 2.3 and 3.7 are moderate;
- Scores between 3.7 and 5.0 are high (In Likert-type scales, the levels are accepted to be higher as the scores approach 5.00, and lower as they approach 1.00).

In line with this information, it was determined that preschool teachers working in the central districts of Eskişehir had high levels of self-efficacy belief (4.58) and classroom management skills (4.60). The scores that pre-service teachers received from the sub-dimensions of the self-efficacy belief scale were also found to be high: learning-teaching process (4.62), communication (4.60), organization of learning environments (4.60), classroom management (4.57), planning (4.56), and parental involvement (4.51). Similarly, it was found that teachers' perceptions about the sub-dimensions of classroom management skills, namely professional skills (4.62) and teacher-child interaction (4.54), were also high.

Findings Related to Differentiation of Self-Efficacy Belief and Classroom Management Skills of Preschool Teachers According to Demographic Characteristics

Difference statistics were calculated to determine whether the self-efficacy belief and classroom management skills of the preschool teachers differ significantly according to the demographic characteristics (age, seniority, type of school graduated from, type of school in which they work, number of children in their classrooms, availability of assistants, and working status). Normality and homogeneity of variances were tested before the calculations, and parametric and non-parametric statistics were used. The results according to the ages of the teachers are shown in Table 3.

As seen in Table 3, preschool teachers' self-efficacy belief significantly differs by age ($X^2_{(3)}$ = 11.910; $p < .05$). As a result of the multiple comparison ANOVA test, which was performed to identify the source of the difference, it was found that self-efficacy belief levels of teachers older than 40 years were significantly higher than those of teachers younger than 30 years. Teachers' self-efficacy belief levels in the learning-teaching process, communication, planning, and organization of the learning environment showed no significant difference by age ($p > .05$), whereas parental involvement and classroom management self-efficacy showed significant differences ($p < .05$). As a result of the multiple comparison tests, it was found that the self-efficacy perception levels of teachers aged at least 40 years for parental involvement and classroom management were significantly higher than those of teachers under the age of 30 years. Concurrently, it was found that 35-39-year-old teachers' self-efficacy belief levels about organizing the learning environment were higher than those of teachers younger than 30 years.

Table 3 reveals that the classroom management skills of preschool teachers did not show a significant difference by age ($F_{(3.273)}$ = 1.533; $p > .05$). Teachers' perceived professional skills and teacher-child interaction skills did not vary significantly ($p > .05$).

Table 6. *Difference Statistics of the Teachers According to the Type of School in which They Work*

Scale	Type of School	*N*	Mean	*SD*	Difference statistics	*p*
Self-efficacy belief	Kindergarten	108	172.78	13.10	$t_{(272)}$ = 3.167	.002
	Preschool	166	167.42	14.07		
Classroom management skills	Kindergarten	108	186.28	10.85	$t_{(272)}$ = 2.471	.014
	Preschool	166	182.73	12.09		

** Independent samples t-test*

Table 7. *Difference Statistics of the Teachers According to the Children in the Class*

Scale	Number of children	*N*	Mean	*SD*	Difference statistics	*p*
Self-efficacy belief	15 or less	46	172.78	14.93	$t_{(272)}$ = 1.744	.082
	16 or more	228	168.87	13.65		
Classroom management skills	15 or less	46	184.61	11.80	$t_{(272)}$ = .304	.761
	16 or more	228	184.03	11.73		

** Independent samples t-test*

Table 8. *Difference Statistics of the Teachers According to the Availability of Assistant Staff in Their Classrooms*

Scale	Assistant Staff	*N*	Mean	*SD*	Difference statistics	*p*
Self-efficacy belief	Available	136	171.99	13.36	$t_{(272)}$ = 2.940	.004
	Not available	138	167.11	14.08		
Classroom management skills	Available	136	185.54	12.13	$t_{(272)}$ = 1.985	.048
	Not available	138	182.74	11.18		

** Independent samples t-test*

Table 4 depicted observed that self-efficacy belief levels of preschool teachers did not show a significant difference by seniority ($F_{(2.273)}$ = 2.391; p > .05). It was also found that the self-efficacy belief of teachers for learning-teaching process, communication, parental involvement, planning, organization of the learning environment, and classroom management did not differ significantly (p > .05).

Similarly, as Table 4 shows the classroom management skills of preschool teachers did not show a significant difference by seniority ($F_{(2.273)}$ = 1.167; p > .05). It was also found that teachers' perceived professional skills and teacher-child interaction skills did not vary significantly (p > .05).

As Table 5 reveals self-efficacy belief levels of preschool teachers did not show a significant difference by the type of school they graduated from ($t_{(272)}$ = .192; p > .05). Similarly, self-efficacy belief levels of the teachers for learning-teaching process, communication, parental involvement, planning, organization of the learning environment, and classroom management did not differ significantly (p > .05).

As can be observed in Table 5, the classroom management skills of preschool teachers did not show a significant difference by the type of school graduated from ($t_{(272)}$ = .092; p > .05). It was found that teachers' perceived professional skills and teacher-child interaction skills did not vary significantly (p > .05).

As observed in Table 6, self-efficacy belief of the preschool teachers who work in the central districts of Eskişehir significantly differs by the type of school in which they work ($t_{(272)}$ = 3.167; p < .05). The review of the average scores showed that the self-efficacy belief levels of teachers working in primary schools were significantly higher than those of teachers working in the kindergarten. It was also found that teachers' self-efficacy for parental involvement did not show a significant difference (p > .05); however, the self-efficacy belief levels of the teachers for the organization of the learning environment, learning-teaching process, communication, planning, and classroom management differed significantly (p > .05). It was found that the self-efficacy belief levels of the teachers working in primary schools were significantly higher than those of the teachers working in the kindergarten.

Regarding the information in Table 6, it can be observed that the classroom management skills of the teachers showed a significant difference by the type of school in which they work ($t_{(272)}$ = 2.471; p < .05). According to the average scores, it was found that the perceived classroom management skills of teachers who work in primary schools were significantly higher than those of teachers who work in kindergarten. Whereas there was no significant difference in teacher-child interaction skills (p > .05) by the type of school in which they work, it was found that there was a significant difference in professional skills (p < .05). Similarly, it was found that the perceived professional skills of teachers who work in primary schools were significantly higher than those of teachers working in kindergarten.

Regarding the information in Table 7, it is observed that self-efficacy belief levels of preschool teachers did not show a significant difference by the number of children in the class ($t_{(272)}$ = 1.744; p > .05). Similarly, self-efficacy belief levels of teachers for learning-teaching process, communication, parental involvement, planning, and organization of the learning environment did not differ significantly according to the number of children in the class (p > .05); however, their self-efficacy belief levels related to classroom management differed significantly (p < .05). When average scores were reviewed, it was found that classroom management self-efficacy belief levels of the teachers who had at most 15 children in their class were significantly higher than those who had at least 16 children.

Table 7 showed that the classroom management skills of preschool teachers did not show a significant difference by the number of children in the class ($t_{(272)}$ = .304; p > .05). It was found that teachers' perceived professional skills did not vary significantly by the number of children in the class (p > .05); however, teacher-child interaction skills were found to be different (p < .05). The review of the average scores showed that the teacher-child interaction skill scores of the teachers who had at least 16 children were significantly higher than those who had at most 15 children in their classes.

As Table 8 reveals self-efficacy belief levels show a significant difference by the availability of assistant staff ($t_{(272)}$ = 2.940; p < .05). The review of the average scores revealed that the self-efficacy belief levels of teachers who had an assistant staff

Table 9. *Difference Statistics of the Teachers According to Working Status*

Scale	Working Status	*N*	Mean	*SD*	Difference statistics	*p*
Self-efficacy belief	Permanent	250	143.62	10.10	z = .809*	.002
	Contracted / paid	24	139.88	12.44		
Classroom management skills	Permanent	250	40.81	4.35	z = .993*	.014
	Contracted / paid	24	41.08	2.98		

** Mann Whitney U test*

Table 7. *Difference Statistics of the Teachers According to the Children in the Class*

Scale	Values	Professional skills	Teacher-child interaction	Class management skill
Learning-teaching process	*r*	.607**	.146*	.588**
	p	.000	.016	.000
	N	274	274	274
Communication	*r*	.628**	.104	.592**
	p	.000	.085	.000
	N	274	274	274
Parental involvement	*r*	.592**	.071	.549**
	p	.000	.238	.000
	N	274	274	274
Planning	*r*	.658**	.104	.619**
	p	.000	.086	.000
	N	274	274	274
Organization of learning environment	*r*	.635**	.130*	.608**
	p	.000	.031	.000
	N	274	274	274
Classroom management	*r*	.657**	.083	.610**
	p	.000	.173	.000
	N	274	274	274
Self-efficacy (overall)	*r*	.727**	.125*	.687**
	p	.000	.039	.000
	N	274	274	274

**p < .05; **p < .01*

were significantly higher than those of the teachers who had no assistant staff. It was found that teachers' self-efficacy levels for parental involvement did not show a significant difference by the availability of assistant staff ($p > .05$); however, the self-efficacy belief levels of the teachers for the organization of the learning environment, learning-teaching process, communication, planning, and classroom management differed significantly ($p < .05$). It was found that the self-efficacy belief levels of teachers who had assistant staff were significantly higher than those of teachers who did not.

Table 8 indicates that the classroom management skills of the teachers showed a significant difference by the availability of assistant staff ($t_{(272)} = 1.985$; $p < .05$). According to the average scores, it was found that the perceived classroom management skills of teachers who had assistant staff were significantly higher than those of teachers who did not. It was found that there was no significant difference in teacher-child interaction skills ($p > .05$) according to the availability of assistant staff, whereas their perceived professional skills showed a significant difference ($p < .05$). Similarly, it was found that the perceived professional skills of teachers who had assistant staff were significantly higher than those who did not.

According to the information in Table 9, self-efficacy belief levels of the teachers did not show a significant difference by working status ($z = .809$; $p > .05$). Similarly, self-efficacy belief of the teachers for learning-teaching process, communication, parental involvement, planning, organization of the learning environment, and classroom management did not differ significantly according to working status ($p > .05$).

Table 9 shows that the classroom management skills of preschool teachers did not show a significant difference by working status ($z = .993$; $p > .05$). It was found that teachers' professional skills and teacher-child interaction did not vary significantly according to working status ($p > .05$).

Findings About the Relationship Between Classroom Management Skills and Self-Efficacy Belief of Preschool Teachers

The Pearson correlation coefficient was calculated to determine the relationships between the classroom management skills and self-efficacy belief of preschool teachers working in the central districts of Eskişehir. The results are shown in Table 10.

Regarding the sub-dimensions of the classroom management skills of preschool teachers displayed in Table 10, it is observed that there is a positive and strong relationship between preschool teachers' perceived professional skills and their self-efficacy belief levels ($r = .727$; $p < .01$).

It was found that there are positive and moderate relationships between teachers' professional skills and some of the sub-dimensions of self-efficacy belief, namely planning ($r = .658$; $p < .01$), classroom management ($r = .657$; $p < .01$), organization of the learning environment ($r = .635$; $p < .01$),

communication (r = .628; p < .01), learning-teaching process (r = .607; p < .01), and parental involvement (r = .592; p < .01).

Table 10 show that there is a positive but weak relationship between teacher-child interaction, which is one of the sub-dimensions of classroom management skills, and self-efficacy belief (r = .125; p < .05). It was found that there were positive and weak relationships between perceived teacher-child interaction skills and learning-teaching process (r = .146; p < .05) and organization of the learning environment (r = .130; p < 0.05), which are among the sub-dimensions of self-efficacy belief.

The findings of the study revealed that there is no significant relationship between preschool teachers' teacher-child interaction skills and communication (r = .104; p > .05), planning (r = .104; p > .05), classroom management (r = .083; p > .05), and parental involvement (r = .071; p > .05).

As it is observed in Table 10, it was found that there was a positive and moderate relationship between the classroom management skills and self-efficacy of preschool teachers (r = .687; p < .01).

Positive and moderate relationships were identified between teachers' perceived classroom management skills and planning (r = .619; p < .01), classroom management (r = .610; p < .01), organization of the learning environment (r = .608; p < .01), communication (r = .592; p < .01), learning-teaching process (r = .588; p < .01), and parental involvement (r = .549; p < .01).

Discussion, Conclusion and Suggestions

Data were collected from 274 preschool teachers to examine the relationship between classroom management skills and self-efficacy belief of preschool teachers and the differentiation of self-efficacy belief and classroom management skill levels of teachers by some demographic characteristics. The relationship between teachers' self-efficacy belief and classroom management skills was analyzed by using descriptive statistics, difference statistics, and correlational statistics. The evaluation of the results of preschool teachers' classroom management skills and self-efficacy belief, which is the first sub-goal of the study, revealed that teachers' self-efficacy belief levels (4.58) and classroom management skills (4.60) were high. Research revealed some similar findings with this study. Babaoğlan and Korkut (2010) examined 401 class teachers to determine their self-efficacy perceptions and classroom management skills and they found that teachers' self-efficacy perceptions and classroom management skills were high. The study of Gömleksiz and Serhatlıoğlu (2013) examined self-efficacy belief levels of preschool teachers and found that the self-efficacy levels of teachers were high. Gökmen et al. (2016) studied 346 preschool teachers to identify their HighScope approach and self-efficacy belief levels. and found that preschool teachers had high levels of self-efficacy belief. Results indicating high self-efficacy belief levels of the teachers in other studies (Yılmaz & Çokluk-Bökeoğlu, 2008; Kesgin, 2006; Guo et al., 2010; Gençtürk, 2008; Akkuş, 2013; Gotch & French, 2013) are consistent with the findings of this research. Since self-efficacy belief is a factor that affects the performance and success of the teachers (Babaoğlan & Korkut, 2010), the high-level self-efficacy belief that preschool teachers have can be considered as a positive fact.

The findings of studies on classroom management skills of the teachers are consistent with the findings of this research as in the self-efficacy belief. In a study aiming to determine the belief and attitudes of preschool teacher candidates and teachers about classroom management, Keleş (2013) concluded that teachers' belief and attitude levels about classroom management were high. Denizel, Güven, and Cevher (2005) examined classroom management skills of preschool teachers and found that the vast majority of the teachers were at a sufficient level. In the study of Aküzüm and Altunhan (2017), in which the relationship between classroom management skills and mainstreaming competencies of 578 preschool teachers were examined, it was found that teachers considered themselves to be very competent in terms of classroom management skills. Regarding the opinions of the teachers about the classroom management skills reported in similar studies, they consider themselves to be an adequate level, which is in parallel with the findings of this study (Arın, Tunçer, & Demir, 2017; Dinçer & Akgün, 2015; Akın, 2006). As in the self-efficacy belief, the high level of classroom management skill perception (Aytekin, 2000), which is the most important factor in teachers' achievement of success from educational activities, can be interpreted as positive.

For the second sub-goal of the research, which was to reveal the differences among preschool teachers according to some demographic characteristics, difference statistics were computed by gender, age, seniority, education level, type of school graduated from, age group of children in their class, the number of children in their class, working time and status, and the availability of an assistant staff.

A difference in teachers' self-efficacy belief levels was observed by age; self-efficacy belief levels of teachers older than 40 years for parental involvement and classroom management were found to be significantly higher than those of teachers under the age of 30 years. For classroom management skills, the age of the teachers did not create any difference, but an increase was observed in the teachers' average classroom management skill score, as the age increased. As a result of the review of self-efficacy belief levels and classroom management skills of the teachers by seniority, no significant difference was observed, but as in the age variable, the average scores taken from the scale increased as the professional seniority increased. In this context, teachers show an increase in self-efficacy belief levels and classroom management skills with age and seniority. This result suggested that the increase in the seniority along with age, increased the experiences and practices of the teachers, and, thus, positively affected their self-efficacy belief and classroom management skills. In the study of Şenol and Ergün (2015) investigating self-efficacy belief of 161 preschool teacher candidates and 177 preschool teachers, it was concluded that teachers' self-efficacy belief levels increased as their age increased. Gökmen et al. (2016) found that self-efficacy belief levels of 31-40 year-old preschool teachers were higher than those of other age groups. Research showed that the increase in the age of teachers had a positive effect on self-efficacy belief levels (Kesgin, 2006; Say, 2005; Şenol Ulu, 2012).

Regarding relevant studies about classroom management skills, some studies found an increase in the skill level by age. The study of Zembat, Küsmüş, and Yılmaz (2018) on preschool teachers' creative thinking dispositions and classroom management, conducted with 199 preschool teachers, found that the averages of classroom management skills of the teachers who were older than 36 years were high. In a similar study by Dinçer and Akgün (2015), preschool teachers' classroom management skills were analyzed by some variables and found that the highest skill perception level was observed among teachers in the 35-39 years age group and those older than 40 years. Koçoğlu (2013) concluded that classroom teachers' classroom management skills were significantly higher in the 41-50 years age group. The findings of some studies (Özgün, 2008; Erol 2006; İlgar, 2007; Durğun, 2010; Aküzüm & Altunhan, 2017 are consistent with the findings of this research, but no significant difference observed in some studies, although there was an increase in the averages by age (Akkaya, 2011; Ekici et al., 2017; Yılmaz & Aydın, 2015).

Research showed that preschool teachers' self-efficacy perceptions increased as their seniority increased (Aslan & Kalkan, 2018; Fives & Buehl, 2009; Gençtürk & Memiş, 2010; Kesgin, 2006; Say, 2005; Şenol & Ergün, 2015; Şenol Ulu, 2012). In a study in which Wolters and Daugherty (2007) looked at 1 024 teachers' self-efficacy belief levels by their professional experience and academic level, they concluded that the self-efficacy belief levels of the teachers with more professional experience were higher. Gökmen et al. (2016) revealed that teachers' self-efficacy belief levels increased as their professional experience increased. Conversely, there are studies indicating that there is no difference in the self-efficacy levels of teachers by seniority (Gömleksiz & Serhatlıoğlu, 2013; Yılmaz et al., 2016). In their study examining preschool teachers' self-efficacy belief, Guo et al. (2010) reported a decrease in self-efficacy belief levels as professional experience increased. In the study in which Gotch and French (2013) looked at self-efficacy belief levels of 3 000 primary school teachers, it was concluded that no difference existed in the self-efficacy levels of the teachers by their seniority. It is thought that seniority has a positive effect on self-efficacy belief as professional experiences and practices increase with increase in seniority, along with the positive effect of on-the-job trainings.

The review of the relevant studies in terms of the relationship between seniority and classroom management skills revealed various results parallel to the findings of this study (Dinçer & Akgün, 2015; Özgan, Yiğit, Aydın & Küllük, 2010). Sadık and Dikici Sığırtmaç (2016) showed that preschool teachers with a seniority of at least 10 years had higher classroom management skills. Aküzüm and Altunhan (2017) reported an increase in classroom management skills as the seniority of preschool teachers increases, and they explained the reason for this with the increase in knowledge, experiences, and practices, as well as the improvement of teachers' behavior towards children with experience. Ekici et al. (2017) reported that classroom management skills of preschool teachers with a seniority of at least 10 years were higher. Zembat et al. (2018) stated that there is an increase in the classroom management skills of preschool teachers as their seniority increases, and this was explained with the increase in classroom management skills occurring because of the increase in teachers' experiences and practices with time spent in the profession. Similarly, although there are studies indicating a positive relationship between professional seniority and classroom management skills (Erol, 2006; İlgar, 2007; İlhan, 2011; Korkut, 2009; Özgün, 2008; Yeşilyurt & Çankaya, 2008), some studies have concluded that there is no significant relationship between seniority and classroom management skills (Akkaya, 2011; Adiguzel, 2016; Cevher, 2005; Denizel Güven & Durğun, 2010; Keleş, 2013; Nur, 2012; Turla, Şahin, & Avcı, 2001; Yılmaz & Aydın, 2015; Zembat et al., 2017). Gezgin (2009) found that the increase in the teachers' seniority affected classroom management skills negatively. In the study in which Toran and Gençgel Akkuş (2016) looked at the classroom management skills of preschool teachers according to some variables, they concluded that there was a negative relationship between seniority and classroom management skills, and classroom management skills decreased as seniority increased. Ekici et al. (2017) explained the reason for the differences in observations made in different studies to be a result of the differences in characteristics of the samples selected for the studies. Dinçer and Akgün (2015) explained the reason for the differences in results of the studies as follows: even though professional experience is an important factor, the extent to which the teacher improving him/herself is an important factor as well.

No difference was observed by type of school graduated from. Similarly, Nur (2012), Turla et al. (2001), and Zembat et al. (2017) reported that classroom management skills of preschool teachers did not differ by the type of school graduated from. Conversely, Dinçer and Akgün (2015) reported that preschool teachers who graduated from formal education had higher class management skills than the ones who graduated from open education. Although the school from which the teacher graduated is a factor, it is thought that teachers' professional development is an important factor in the self-efficacy perceptions and classroom management skills as well.

It was found that there was a significant difference in both self-efficacy belief levels and classroom management skills of preschool teachers by the type of school that they worked in; the teachers working in preschool classes of primary schools had higher belief levels and skills. It was also found that the teachers who work in primary schools had significantly higher self-efficacy belief levels for the organization of learning environment, learning-teaching process, communication, parental involvement, planning, and classroom management than the teachers working in the kindergarten. Similarly, it was found that the teachers who work in primary schools had significantly higher levels of perceived professional skills than the teachers working in kindergarten. Tschannen-Moran and Woolfolk-Hoy (2001) claimed that external factors, such as the class size and equipment of the school, have more influence on the self-efficacy belief levels than the personal characteristics of teachers. In this regard, it is observed that teachers are influenced by the type of school they work in, which is an external factor.

Regarding studies examining self-efficacy belief levels of teachers by the type of school they work in, it is observed that there are different results. Gömleksiz and Serhatlıoğlu (2013) reported that self-efficacy perception levels of preschool teachers working in both kindergarten and primary schools were high, and there was no statistically significant difference among them. Kadim (2012) examined preschool teachers' self-efficacy belief levels in sports activities according to the school they work in, and concluded that the opinions of teachers working in kindergarten and primary schools differed in some cases, whereas they were similar in some cases. Gençtürk (2008) investigated the self-efficacy and job satisfaction of primary school teachers according to various variables, including type of school they work in, and reported that regarding the self-efficacy belief levels of teachers working in private and public schools, there was a difference in favor of private school teachers. The reason for this result was explained as follows: teachers needed to have a good performance in private schools for the continuity of their work, and private schools had better educational conditions. In this study, it is thought that teachers working in primary schools may be more motivated by the fact that they can observe the educational progress of the children in the primary school, which is the next education level.

Regarding the evaluation of the classroom management skills in terms of the type of school that teachers work in, Denizel-Güven and Cevher (2005) found a similar result in their research; they explained the reason for teachers working in primary schools having higher class management skills with the fact that they had shorter working hours, which had an impact on the teachers' level of burnout and affected their classroom management skills. However, Ekici et al. (2017) reported that teachers did not differ in classroom management skills by the type of school they work in. Zembat et al. (2017) concluded that the classroom management skills of the teachers working in kindergarten were higher than those of the preschool teachers working in primary schools, which is contrary to the research findings. The fact that the studies indicated different results showed that although the school type is an effective factor on both self-efficacy perceptions and class management skills of the teachers, its effect on the teacher may vary by the sample.

Regarding the difference in self-efficacy perceptions and classroom management skills of the teachers according to the number of children in their class, it was found that the self-efficacy belief levels of the teachers with at most 15 children in the class were significantly higher than those with at least 16 children. For the teacher-child interaction skills, which is one of the sub-dimensions of classroom management, teacher-child interaction score was found to be significantly higher for teachers with at least 16 children in their class than those of teachers with at most 15 children. Dinçer and Akgün (2015) reported that class management skills of the teachers with at least 16 children in their class were higher. In his research on classroom teachers, Erol (2006) revealed that classroom management skills of the teachers with a large class size were also high, which supports the result of the current research. Similarly, the result indicating that "the classroom management skills of the teachers with higher class sizes are higher" is consistent with the findings of Yalçınkaya and Tombul (2002), Sirkeci (2010), and Zembat et al. (2018). However, some studies (Adıgüzel, 2016; Denizel-Güven, & Cevher 2005; Durğun, 2010; Ekici et al., 2017; Metin et al., 2017; Toran & Gençgel-Akkuş, 2016) reported that class size did not make a significant difference. Ilgar (2007) found that teachers' classroom management skills were negatively affected by the class size. Although it seems that the increase in class size makes classroom management more difficult (Ekici et al., 2017), it is thought that having at least 15 pupils in the class increases interaction among children and allows teachers to plan activities in a more diverse manner, thus facilitating classroom management (Dinçer & Akgün, 2015).

No significant difference was observed in self-efficacy belief levels and classroom management skills of teachers by working status. Ekici et al. (2017) also reported that there was no difference in classroom management skills of teachers by working status. Dinçer and Akgün (2015) found a significant difference in favor of permanent teachers; they reported that this may be due to the fact that permanent teachers felt that they belong to the institution. Although a teacher's working status is an important factor, the fact that there is no difference in the results of the study suggested that teachers' classroom management skills are related to self-development and their love for the profession (Ekici et al., 2017).

Regarding availability of assistant staff, significant differences were observed in both classroom management skills and self-efficacy belief levels. It was found that teachers with assistant staff have significantly higher self-efficacy belief levels in organizing learning environments, learning-teaching process, communication, parental involvement, planning, and classroom management than those without assistant staff. Regarding classroom management skills, it was found that teachers with assistant staff have significantly higher perceived professional skills than those who do not. Conversely, Dinçer and Akgün (2015) concluded that the availability of assistant staff in the classroom had no effect on the classroom management skills of teachers. The fact that there is a significant difference by availability of assistant staff in the research suggested the idea that having assistant staff makes teachers feel more comfortable in the classroom, and consequently to be more effective in using their knowledge and skills.

Regarding the relationship between teachers' self-efficacy belief and classroom management skills, a positive and moderate relationship was observed. It was found that there were positive and moderate relationships between teachers' perceived classroom management skills and planning, classroom management, organization of the learning environment, communication, learning-teaching process, and parental involvement self-efficacy belief. The evaluation of this relationship by the sub-dimensions of classroom management skills showed that there was a positive and strong relationship between preschool teachers' perceived professional skills and self-efficacy belief; there were positive and moderate relationships between professional skills and parental involvement, planning, learning-teaching process, communication, classroom management, and organization of learning environment, which are sub-dimensions of self-efficacy belief.

It was found that there was a positive but weak relationship between teacher-child interaction, which is a sub-dimension of classroom management skills, and self-efficacy belief; whereas there are positive and weak relationships between teachers' perceived teacher-child interaction skills and self-efficacy belief for teaching process and organizing the learning environment, which are among the sub-dimensions of self-efficacy belief. Babaoğlan and Korkut (2010) found a moderate relationship between teachers' self-efficacy belief and classroom management skills, supporting the findings of this study. Similarly, Savran and Çakıroğlu (2003) found that pre-service teachers had a positive relationship between effective teaching belief and class management skills. In this study, the moderate relationship between preschool teachers' self-efficacy belief and classroom management skills indicates that if one of them increases, the other would increase as well, whereas a decrease in one will cause a decrease in the other.

As a result, it was observed that preschool teachers' self-efficacy belief and classroom management skills were affected by teachers' age, seniority, type of school they work in, and the number of children in the class; these variables played a role in teachers' belief levels and skills. The moderate positive relationship between teachers' self-efficacy belief and classroom management skills showed that the qualities achieved in these two areas have an effect on each other.

Regarding the results of the study, it can be suggested that in-service training programs should be organized to develop the self-efficacy belief and classroom management skills of new teachers working in kindergarten. Arrangements about preschool teachers to have auxiliary staff in the classrooms are recommended. In addition, it may be suggested that different scales be developed to determine the effects of preschool teachers' personal characteristics and educational environment, as well as to develop intervention programs on the possible negative effects of the variables.

Limitations and Directions for Future Research

This study extended the scope of research about teachers' self-efficacy belief and classroom management skills. However, the research also has some conceptual and methodological limitations. First, conceptually, in Turkey there are limited number of studies of this nature conducted in preschools; thus, the findings were mostly discussed with the results obtained from other levels of education. Considering the educational environment and developmental differences of children, it should be noted that teachers' self-efficacy belief and classroom management skills may change. There are also methodological limitations. The study sample consisted of 274 teachers working in a certain province in Turkey. Teachers' belief levels and skills are thought to change by the regions in which they work. For future studies, it is important to work with a larger sample in various other parts of Turkey to confirm the findings of the current study. Because selecting elements process from the population to examine the study sample, future studies may have a chance to generalize their results back to the population from which they were picked. Another methodological limitation is the use of quantitative research. Teachers filled the scales according to their own opinions. In the future, more in-depth studies using both qualitative and quantitative research methods can be conducted to further confirm the findings. Additionally, research on how the perceptions of self-efficacy belief and classroom manage-

ment skills of teachers whose belief and skills have been identified are reflected in classroom practices.

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Investigation of Rater Tendencies and Reliability in Different Assessment Methods with Many Facet Rasch Model

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Abstract

One of the most commonly used methods for measuring higher-order thinking skills such as problem-solving or written expression is open-ended items. Three main approaches are used to evaluate responses to open-ended items: general evaluation, rating scales, and rubrics. In order to measure and improve problem-solving skills of students, firstly, an error-free measurement process should be performed. Errors caused by raters such as bias, high or low tendency to score is a common problem in the evaluation of open-ended items as they adversely affect the accuracy of decisions to be made. This study utilized open-ended items to evaluate the raters' tendencies in terms of general evaluation, rating scale, and rubric conditions. The raters' behaviours in each assessment method and their opinions about the assessment methods were determined. The participants of the study consisted of 12 different mathematics teachers and the Many Facet Rasch Model was adopted for the analyses. The scoring reliability of each method was estimated. The findings of the rating scale revealed that the raters had a more homogeneous scoring tendency. In addition, while the majority of raters stated that they prefer to use a rubric, they also stated it is the most difficult method to use.

Keywords: Many Facet Rasch Model, Problem-Solving, Rater Reliability, Rater Tendency, Rating Scale, Rubric

Introduction

The quality of assessment, monitoring, and evaluation processes are directly related to the quality of the measurement tools used in these processes. The quality of these tools, which entails the ability to measure as far as possible and without errors, is determined by the quality of the items. Different item types have been developed to measure learning at different cognitive levels during the education process (Çıkrıkçı, 2010). The two basic item structures used are multiple-choice items that students choose to respond to and constructed response items that students construct themselves (Crocker & Algina, 1986; Roid & Haladyna, 1982). When deciding which item to use, item type which is more suitable for the feature to be measured, is recommended (Kastner & Stangla, 2011; Popham, 2008; Rodriquez, 2002; Roid & Haladyna, 1982). Therefore, the main factor to be considered is the cognitive level of the feature to be measured. Especially in classroom assessments, where multiple knowledge and skills are wanted to be measured at different cognitive levels, different item structures can be used together. Many large-scale national and international evaluation studies such as National Assessment of Educational Progress (NEAP), Scholastic Aptitude Test (SAT), Trends in International Mathematics and Science Study (TIMMS), Programme for International Student Assessment (PISA) include both multiple-choice and open-ended items (DeCarlo, Kim, & Johnson, 2011; Kim, 2009; Mariano, 2002).

In some cases, the use of open-ended items is a necessity. For example, using multiple-choice items to measure problem-solving skills only serves for "finding the right result" step of problem solving skills. However, problem-solving process is also crucial for problem solving skill. Therefore, open-ended items are often needed in mathematics classes. Open-ended items are used in situations where students are asked to form their own answer, such as problem solving (Kastner & Stangla, 2011; Messick, 1994; Park, 2017; Rodriquez, 2002; Roid & Haladyna, 1982). Open-ended items are beneficial if students need to plan and configure the answer to the question at hand (Haladyna, 1997). Using open-ended items, more in-depth measurements of students' knowledge and skills can be conducted (Pollack, Rock, & Jenkins, 1992; Rodriquez, 2002). In addition, incomplete and inaccurate learning can be detected (Cooper, 1981). With open-ended items, students' responses can be obtained in a similar way to the behaviours that students should exhibit in real life (Popham, 2008). Because of these advantages, open-ended items are frequently used in classroom measurement and evaluation activities.

In addition to the advantages of open-ended items, there are also negative aspects such as the difficulty of scoring (DeCarlo, 2005, 2010; DeCarlo et al., 2011; Linacre, 2003; Popham, 2008; Wang, 2012). While two different raters will give the same multiple-choice test item the same score, it may not always be possible for two different raters to evaluate the same open-ended test item at the same score (Haladyna, 1997), because open-ended items do not have a clear and a single correct response as in multiple-choice items. In the scoring process of these items, there is more than one rater who uses general evaluation, a rating scale, or a rubric. In general evaluation approach, evaluation is made according to the criteria determined by the rater. Therefore, it can result in errors such as severity, leniency, or bias caused by the rater. Rating scales, on the other hand, provide raters with basic assessment criteria while not completely preventing the leniency and severity of raters. Rubrics provide raters with both assessment criteria and explanations of those criteria. Therefore, it is an evaluation method that prevents errors caused by raters more than the others. Accordingly, the evaluation method determined will significantly reduce errors caused by raters, although not completely eliminating them.

Evaluations conducted with more than one rater will increase the accuracy in determining student achievement (Mariano, 2002). It is essential for validity and reliability that the scores given by raters during evaluation processes are as accurate and as fair as possible (Linacre, 1994). However, although it is tried to be prevented by the choice of evaluation method, rater errors such as rater generosity, inconsistency, and bias

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occur (Myford & Wolfe, 2003; Donoghue & Hombo, 2000). Especially when there are differences between the scores given by different raters, a situation that is often difficult to solve, it is necessary to determine how raters differ (Linacre, 1990). The fact that raters give different scores indicates that rater reliability and objectivity are low. Rater reliability is defined as the degree of consistency between the scores of two or more raters regarding different individuals and different items (Aiken, 2000; Anastasi & Urbina, 1997). It is crucial to consider the presence of rater effects, especially when using open-ended substances (Kim, 2009; Linacre, 1994). Under different theories for determining rater effects, there are techniques such as generalizability theory, Cohens 'Kappa coefficient, and Fleiss Kappa coefficient, which are used in the literature. Another technique used to determine rater effect is the Many Facet Rasch Model.

The Many Facet Rasch Model incorporates the rater parameter, allowing raters to estimate the severity level simultaneously (Linacre, Wright, & Lunz, 1990). In this way, bias caused by raters in measurements of students and items are eliminated (Linacre, 1989; Sudweeks, Reeve, & Bradshaw, 2004). In this model, four factors that are generally thought to affect student scores are defined. These factors are student level, item or task difficulty, rater severity, and assessment tool (Linacre et al., 1990; Linacre & Wright, 2004). If necessary, other influencing factors can be added to the model. The most important advantage of the model is that it treats different raters as a source of variability. Rater severity or leniency means that any scores that are given by a rater are systematically higher or lower than the average scores given by other raters. This is also referred to as rater effect or rater error (Engelhard & Myford, 2003). This model includes rater severity levels. An effective rater is an individual who can always score with the same tendency and share a common understanding of the rating scale with other raters. In other words, no matter which rater scores a student, the score should always have the same relationship with all raters. This indicates objectivity (Linacre, 1994).

In the literature, there are many studies conducted using the Many Facet Rasch Model (Akın & Baştürk, 2012; Atılgan, 2005; Baştürk, 2010; Engelhard, 1994; Engelhard & Myford, 2003; Iramaneerart, Myford, Yudkowsky, & Lowenstein, 2009; Linacre et al., 1990; Nakamura, 2000; Nakamura, 2002) and directly examining the Many Facet Rasch Model (Casabianca & Junker, 2013, 2014; DeCarlo 2010; DeCarlo et al., 2011; Iramaneerat, Yudkowsky, Myford, & Downing, 2008; Kim 2009; Lynch & McNamara, 1998; Mariano, 2002; Patz, Junker, & Johnson, 2000; Patz, Junker, Johnson, & Mariano, 2002; Sudweeks et al., 2004; Verhelst & Verstralen, 2001; Wilson & Hoskens 2001). These studies are aimed at revealing the effect of the scoring category and the number of raters on the reliability of the measurements. Junker and Patz (1998), DeCarlo et al. (2011), Donough and Hombo (2000), Mariano (2002), Patz et al. (2002) stated that multi-category scoring would increase the accuracy of scoring. Junker and Patz (1998) stated that more accurate measures of student achievement could be obtained by using higher number of raters rather than giving students more items. Lunz and Schumacker (1997) found that task difficulty was useful in scoring. Alharby (2006) compared two different approaches in scoring (holistic and analytical rubric) and examined the reliability of the measurements. They found that the holistic approach was a better fit for analytic approach. Sebok (2010) stated that it is advantageous to use the Many Facet Rasch Model model with small samples and missing data, and it is the most appropriate method when individual evaluation is desired.

There are also studies that compare different assessment methods in the literature like Doğan and Uluman (2017), Boztunç-Öztürk, Şahin and İlhan (2019), Çetin and Kelecioğlu (2004), Ömür and Erkuş (2013), Akın and Baştürk (2012), Engelhard (1994), Sudweeks, Reeve and Bradshaw (2004), Özbaşı and Arcagok (2019). These studies investigated different scoring methods with G theory and/or Many Facets Rasch model. Doğan and Uluman (2017) determined the extent to which graded-category rating scales and rubrics contribute to inter-rater reliability. They estimated raters reliability by intraclass correlation coefficient, generalizability theory (G-theory) and Many-Facet Rasch model. The results indicated higher inter-rater reliability when graded category rating scale was used. Another example study conducted by Alharby (2006) aimed to determine the reliability of the measurements and rater tendencies to give scores obtained by three different assessment methods where different assessment methods were compared using two different rubric types. In the present study, the scoring tendencies of the raters were evaluated individually using the Many Facet Rasch Model.

In the Many Facet Rasch Model, values are generated for a measurement (logit estimation obtained from the analysis), a standard error (information on the precision of the logit estimation) and compliance indicators (information on how well the data fit into the model) for all elements of all variability sources (Engelhard & Myford, 2003). The validity of parameter estimations is obtained by statistical quantification of the fit of the model with the data (Wright & Masters, 1982). Therefore, the reliability and the validity of raters can be estimated in addition to rater trends in the model. Especially the prediction of teacher tendencies is the most significant advantage of the model since raters' severity/leniency significantly affects the reliability and the validity of the measurements. In this respect, the present study aimed to examine the change of rater tendencies according to general evaluation, rating scale, and rubric. For this purpose, the change of raters' tendencies and rater reliability to the assessment method are estimated with the Many Facet Rasch Model.

Methodology

Research Design

Qualitative and quantitative data are used together in the research. In this respect, the research is mixed model research. Mixed methods research is the type of research in which a researcher or team of researchers combine elements of qualitative and quantitative research approaches (e. g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration (Johnson et al. 2007, p. 123). Mixed Methods-Design (Quan + qual) (Guest 2013) was adopted as qualitative data were used as dominate.

Data Collection Method

The participants of this research are mathematics teachers of 12 different elementary schools. The participant teachers were asked to evaluate six different students' problem solutions with general evaluation, a rating scale, and a rubric. Then, the teachers' opinions about these three assessment methods were collected.

First, a mathematics problem was prepared in a question form and six different students were asked to solve these problems. The answers obtained from these six students were given to the teachers to be evaluated using three different methods.

The first method was general evaluation. The answers of the students were given to the mathematics teachers without specifying any scoring criteria, and they were asked to score through general evaluation. After general evaluations were taken, teachers were given the rating scale prepared by the researcher and were asked to evaluate students' answers based on this scale. Finally, the teachers were asked to evaluate the answers with the rubric prepared by the researcher

for these problems. With these three processes, six different students' problem-solving skills were evaluated based on general evaluation, the rating scale, and the rubric and the results were recorded. The data obtained were used to compare the different evaluation methods used by the teachers in terms of scoring tendencies and reliability.

One week after the application, interviews were conducted with the same raters to determine their views and the scoring strategies they applied in these three assessment methods. With the data obtained from the interview form, the opinions of the teachers on the evaluation methods and their preferences were identified.

Instruments

During the data collection process, the study used a rating scale, a rubric, and an interview form. There was no guidance in the general evaluation and teachers were asked to score according to their own assessment criteria.

Rating scale. There are four dimensions in the rating scale developed to evaluate problem-solving skills. They are as follows: Understanding the problem, determining a solution strategy, problem-solving, and checking the result of the problem. The teachers were asked to evaluate according to these dimensions and to give a score between 1 and 3.

Rubric. Rubrics were obtained by creating criteria for the dimensions used in the rating scale. When determining the criteria, possible student responses were taken into consideration. The teachers were asked to evaluate student responses considering these criteria.

Questionnaire. An interview form consisting of questions about which assessment tool teachers prefer to use and whether they tend to score high or low was developed and conducted with the participant teachers.

Analysis

Quantitative analysis – Many facet rasch analysis

FACETS software developed by Linacre (1994) was used for the analysis of the observation data obtained in the study. In this research, there are three surfaces to be analysed in the Rasch measurement model. The rater severity/leniency are four dimensions and 12 raters used to score skills. Since the aim of this study was to reveal the scoring tendencies of the raters and to determine their reliability, the reported findings were limited to reporting them. The data obtained from general evaluation, the rating scale, and the rubric were analysed separately, and the results were presented comparatively.

In Many Facet Rasch analysis, fit statistics, separation index, and separation index reliability (R) and chi-square statistics were calculated for each facet.

Fit statistics

This statistics show how much the expected scores match the observed scores (Engelhard & Myford, 2003; Linacre, 1989; Wright & Linacre 1994). In other words, it gives information about the degree of fit of the data to the measurement model (Lee & Kantor, 2003). If the data fit the model, researchers can provide useful and informative comparisons between sources of variability (Engelhard & Myford, 2003). Large differences between observed and expected scores (expressed as standardized residues) are indicative of surprising or unexpected results. These residual values are shown as the mean of error squares statistics called outfit and infit. Outfit statistics gives an index of the average weighted squares of residual values between expected and observed points (Engelhard, 1994). Outfit statistics are very sensitive to unexpected endpoints. Infit statistics weighted residual values are the mean squares. It is less sensitive to unexpected endpoints due to residual value statistics (Engelhard & Myford, 2003; Iramaneerat et al., 2008).

These statistics have the same distribution and interpretation, and the acceptable range of these statistics is between 0.8 and 1.2 (Linacre, 1994). The values obtained in this range can be described as efficient, thus, it is possible to conclude that the data model is fit.

Separation index and separation index reliability

Both indexes provide information about the reliability value. Separation index provides information on the degree to which all elements of each variance source are separated from each other (Lee & Kantor, 2003). In other words, it gives a measure of the spread (variability) of the precision of the source of variability. The second reliability value is separation index reliability (R). This index provides information on how well the elements in a source of variability can be reliably separated to identify the source of variability. This index is similar to traditional reliability statistics such as KR-20 Cronbachs' Alfa (Bond & Fox, 2001; Engelhard & Myford, 2003; Myford & Wolfe, 2003; Sudweeks et al., 2004).

Separation index reliability for each variance source was 0.0 to 1.0; the index of separation ranges from 1 to infinity (Sudweeks et al., 2004). The fact that the separation index reliability is close to 1.0 is indicative of a high level of reliability and is a desirable level (Bond & Fox, 2001). For the student variability source, the separation index and the separation index reliability are desirable to have a high value whereas, for other variability sources, it is desirable to have a low value because variability between the elements in other sources of variability is an indicator of an undesirable variance in the scores (Engelhard & Myford, 2003; Sudweeks et al., 2004). This index gives the spread of rater severity levels. An index of 1.0 can be considered as an indicator that raters score at similar severity levels and may be interchangeable, and this situation is desirable for raters (Engelhard & Myford, 2003). Low values of these two statistics can be interpreted as the measurements obtained for different elements of the source of variability as it shows a high degree of stability (no inconsistency) (Sudweeks et al., 2004).

Chi-square statistics

Chi-square statistics are used to calculate whether there is a significant difference between the sources of variability. In other words, the chi-square test is used to test whether there is a significant difference between the severity levels of the raters. A significant chi-square statistic ($p < .05$) indicates that there is a difference between at least two of the rater severity levels (Myford & Wolfe, 2004).

Qualitative data analysis

The responses of the participants to the questions in the interview form were analysed using content analysis. Content analysis was performed by two different encoders. First of all, coding rules were determined, and the encoders obtained the categories and the themes by coding the data separately. The reliability coefficient based on inter-coders compliance (Miles & Huberman, 1994) was recorded as .87.

Qualitative and quantitative data analyses were performed separately, and reported findings were interpreted together. The findings from the qualitative data analysis were used to follow through the findings from the quantitative data analysis.

Results

In order for the data used in the analysis to be compatible with the model, the absolute value of less than about 5% of the standardized values (*z* score) must be greater than or equal to 2, or, less than about 1% of the standardized values must be lower than or equal to 3 (Linacre, 2003).

Table 1. *Standard Values for Model Fit*

	Number of Observation	General Evaluation	Rating scale	Rubric
+/- 3	288	2 (.007 %)	1 (.003 %)	1 (.003%)
+/- 2	288	3 (.010 %)	3 (.010 %)	2 (.007 %)

When Table 1 is analysed, it can be seen that z values are in the required range. According to this model fit was provided for the main analysis. First of all, whether there was a difference between the scoring tendencies of the raters in all three assessment methods was tested. The hypothesis "There is a significant difference between raters in terms of their severity/leniency" was tested with the Chi-Square. In addition, the reliability of the raters was estimated for all three methods.

Table 2. *Mode Fit and Raters' Reliability*

	General Evaluation	Rating Scale	Rubric
RMSE (Model)	.24	.11	.15
Fixed (all the same) chi-square	146.4	139.8	144.9
d.f.	11	11	11
significance	.00	.00	.00
Random (normal) chi-square	14.6	13.1	13.9
d.f.	10	10	10
significance	.36	.26	.37
Separation index (for raters)	7.23	4.94	6.51
Reliability (for raters)	.84	.63	.79

When the separation indices presented in Table 2 are examined, it is seen that the smallest value is obtained from the situation where the rating scale was used. The highest separation index is obtained from the general evaluation condition. The high index of separation shows that the scores given by the raters are different. Accordingly, the highest differentiation in the scores given by the raters is in the general assessment condition. The smallest difference in the scores given by the raters is in conditions in the evaluations with the rating scale. Accordingly, the scoring tendencies of the raters are closer when the rating scale is used.

As for the separation index reliability of the raters', a result similar to the separation index can be found. This high index shows that the raters gave different scores. However, the raters were expected to give similar scores and be consistent with each other. The separation index reliability coefficients of the raters' were found to be .84 for the general assessment method, .63 for the rating scale, and .79 for the rubric. Accordingly, the scores given by the raters are more homogeneous than the other conditions when the rating scale was used. In other words, more consistent scores were given by the raters when the rating scale was used. The highest differentiation between the scores given by the raters was in the condition that the general evaluation method was used.

When the chi-square values presented in Table 2 are examined, it is seen that there is a significant difference between the leniency and the severity of the raters in all three evaluation methods ($\chi^2_{\text{general evaluation}} = 146.4$ $sd = 11$, $p = .00$; $\chi^2_{\text{rating scale}} = 139{,}8$ $sd = 11$, $p = .00$; $\chi^2_{\text{rubric}} = 144.9$ $sd = 11$, $p = .00$). Therefore, the null hypothesis was rejected. Accordingly, there is a significant difference among the leniency/severity of the raters. Table 3 presents the raters' leniency/severity rankings.

Table 3. *The Raters' Leniency/Severity Rank*

	General evaluation			Rating scale			Rubric		
	Rater	Infit	Outfit	Rater	Infit	Outfit	Rater	Infit	Outfit
Severity	11	1.2	1.1	11	1	1.1	11	1.3	1.2
	7	1.1	1.3	7	0.8	0.8	3	1.1	1.2
	4	1.18	1	8	0.8	0.9	7	1.1	1
	3	1.18	1	3	0.9	1	2	1.1	0.9
	6	1	1.1	2	1.1	1.1	6	0.9	0.9
	12	0.8	0.9	6	1.1	1	9	0.8	0.8
	1	0.8	0.9	1	1.1	1.1	12	0.8	0.9
	9	0.9	0.8	9	1.2	1	8	1	0.9
	8	0.9	0.8	5	0.8	0.9	10	0.8	0.7
	10	1.1	0.7	12	0.9	0.9	4	1.2	1.1
	5	1.1	0.7	4	0.9	1	1	1	1.1
	2	1.0	1,1	10	1.1	1.2	5	0.8	0.9

The quality control limit specified in the "infit" and "outfit" values in Rasch analysis is between 0.6 and 1.4 (Wright & Linacre, 1994, p. 375-380). Accordingly, the raters made appropriate scoring in all evaluation conditions. The most severe rater was rater 2 when the general evaluation method was used, it was rater 10 when the rating scale was used, and rater 5 when the rubric was used. The most generous rater was rater 11 in all scoring methods. In Figure 1, the raters' leniency/severity rankings between -1.25 logit and 2.25 logit are presented.

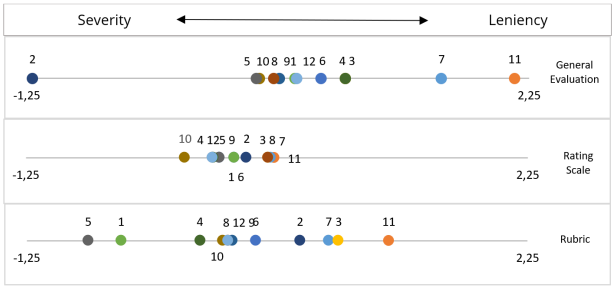

Figure 1. The Raters' Leniency/Severity Rank

When the general evaluation method is used, it is observed that the leniency/severity tendency of the raters are in a widest range, followed by the rubric. The rating scale case showed the smallest range among the three methods. Accordingly, the scoring tendencies of the raters became similar when the rating scale was used, while the raters' tendencies differed in the general assessment. Therefore, the use of the rating scale method enabled the raters to be objective at the highest degree. In the general evaluation method, the raters were found to be more subjective. In other words, it can be stated that the error rate caused by the rater factor was higher.

When the rating scale was used by the raters, teachers' leniency/severity tendencies approached each other. Reliability in terms of objectivity is provided by different raters giving similar scores. Objectivity is particularly affected by errors caused by the rater. When the rating scale is used, the raters' tendency to score is closer to each other when compared with the other two assessment methods, and it can be claimed that they make more objective scoring. General evaluation was the method most affected by the raters' personal judgments, and therefore the objectivity is the lowest. As the raters' tendencies obtained in the general evaluation are examined, it is

Table 4. *The Results for Differences in The Raters Scorings*

Assessment tools	Raters	Negative Rank	Positive Rank	Tieg	Negative Ranks Mean	Positive Rank Mean	Sum of Negative Ranks	Sum of Positive Ranks	*z*	*p*
General evaluation	2	0	4	2	0	2.5	0	10	-2.000	.046*
	3	4	0	2	2.5	0	10	0	-2.000	.046*
	7	5	0	1	3	0	15	0	-2.070	.038*
	11	5	0	1	3	0	15	0	-2.041	.041*
Rating scale	7	5	0	1	3	0	15	0	-2.060	.039*
	11	5	0	1	3	0	15	0	-2.060	.039*
Rubric	3	6	0	0	3.5	0	21	0	-2.201	.028*
	5	0	6	0	0	3.5	0	21	-2.214	.027*
	7	5	0	1	3	0	15	0	-2.060	.039*
		6	0	0	3.5	0	21	0	-2.220	.026*

*$p < .05$

seen that the range is the largest. When rubric was used as the evaluation method, a more homogeneous result than the general evaluation. Thus, it can be stated that the most objective method is the rating scale, and the least objective method is the general evaluation method.

The responses of six different students were evaluated by the professors in five different mathematics fields using general evaluation, the rating scale, and the rubric. The student scores determined by these five different evaluators and the scores given by the raters were compared in pairs with the Wilcoxon test. Whether there is a significant difference between the raters' scores and the scores determined by the professors was tested. Test results are presented in Table 4.

When Table 4 is examined, it is revealed that some of the raters scored higher or lower than expected. Four raters in the general evaluation method and four raters in the rubric method gave significantly higher or lower scores than they should have whereas in the rating scale method, two raters scored significantly higher or lower than expected. Furthermore, rater 11 and rater 7 had the tendency to give high scores in all of the assessment tools used, in other words, their tendency of giving score did not depend on the assessment tools. It is seen that rater 2 tended to give low scores when the general evaluation was done. However, the rating scale and the rubric were used, the rater changed the tendency to give low scores and gave accurate scores. Similarly, rater 5 gave low scores when the rubric was used to assess, but in the other cases, the rater gave accurate scores. So it can be claimed that rater 5 lost the tendency to give objective scores when the rubric was used. In the case of general evaluation and the rubric rating, more raters gave significantly higher or lower scores than in the case of rating scale. Therefore it can be said that when the raters used rating scales to assess the students' answers, they were more objective than the other cases where general evaluation or evaluation with the rubric were used.

The results of the content analysis of the raters' opinions about the type of the assessment tools and their own tendencies to give scores are presented below. Table 5 presents the raters' opinions on their scoring tendencies.

Table 5. *Raters' Views on Their Own Scoring Behaviour*

	Scoring tendencies		
	High scores	Objective scores	Low scores
Raters	3*, 5*, 6, 7*, 8, 10, 11*	1, 2*, 4, 9,1 2	-

Table 5 presents the evaluators' scoring tendencies. Accordingly, rater 3, 7, and 11 had the tendency to give score significantly higher. The opinions of these raters confirm their tendency to give high scores. In other words, these raters were aware of their tendencies. Raters 2 and 5 tended to give low scores in some cases, however, in the interviews, rater 5 claimed to give higher scores while rater 2 stated to score objectively. Considering that they did not exhibit the same tendencies in all conditions, it can be stated that there is a tendency to be exhibited depending on the evaluation method used.

Table 6. *Approaches of Raters for Assessment Tools*

	General evaluation	Rating scale	Rubric
Prefer to use	11, 8	1, 5, 9, 12	2, 3, 4, 6, 7, 10
Difficult to use	1, 3, 4, 5, 6, 7, 10, 11	2, 9	8, 10, 11, 12

Only two of the raters preferred the general evaluation method while the other raters indicated that they preferred rubrics. While the majority of the raters considered the general evaluation method as difficult, the rating scale was evaluated as difficult by two raters. Table 7 provides explanations of why raters find assessment methods difficult. The raters' opinions were classified in psychometric property, evaluation characteristics, and application themes. The explanations of the themes are presented preceding the tables:

Psychometric property

It includes phrases about the validity and the reliability of assessment tools. For example, the term `consistent` is related to reliability, so if a rater mentions it, it is classified under this theme.

Evaluation characteristics

It includes phases of assessment tools such as descriptions of tasks, criteria for evaluation of answers.

Application

It includes a statement about the application of assessment tools. For example, if the rater says that it takes a long time to develop or implement an assessment tool, this opinion is classified under the application theme.

It is seen that lack of criteria, being subjective, and giving points by comparing students were expressed as negative

Table 7. *The Raters' Views on The Negative Aspects of The Assessment Tools*

	General evaluation		Rating scale		Rubric	
Theme	Categories	Rater	Categories	Rater	Categories	Rater
Psychometric property	Subjective	1, 5, 6, 10, 12				
Evaluation characteristics	Without criteria	7, 11, 1, 3, 4, 5, 6	Descriptions are not enough	10, 2		
	Requires benchmarking.	3, 5, 10	Not enough to show differences within students' levels.	2		
Application					Take more time for developing and applying.	9, 10, 11, 12
					Difficult to understand	12

Table 8. *The Raters' Views on The Positive Aspects of The Assessment Tools*

	General evaluation		Rating scale		Rubric	
Theme	Categories	Rater	Categories	Rater	Categories	Rater
Psychometric property			It is consistent	5	It is consistent	3, 8, 10
Evaluation characteristics			Criteria are understandable.	1	Criteria and explanations are clear and understandable.	6, 7, 3, 4
			Includes enough explanation.	12, 1	The process to be followed is systematic and clear.	4, 7
			Considers all necessary skills	9	Includes all answer categories	10, 2
Application	Allows creating your own criteria.	11, 8	Saves time	1,9,12		

characteristics of general evaluation method. However, general evaluation method was not criticized in terms of application. The lack of an adequate definition of the rating scale and not enabling showing differences within students' levels were categorized as negative characteristics. It was not criticized in terms of psychometric properties or practice. For rubric, the negative features were difficult to understand and difficult to develop and implement. It was found that the characteristics of psychometric and method characteristics were not criticized. Accordingly, rubrics are found to be difficult only in terms of usability.

The opinions about the positive aspects of the instruments are presented in Table 8.

When Table 8 is analysed, it is seen that the general evaluation method is preferred because of only one reason, which is allowing creating your own criteria, and just two raters supported the method for this reason. Therefore, it can be said that the other raters thought that this method is not suitable for assessing student achievement. In other words, the raters did not think that the general evaluation method has any psychometric property or excellent characteristics property. Four raters preferred to use rating scales when assessing students' achievement because of characteristics aspect such as having clear/understandable criteria, including sufficient explanation for criteria and considering necessary skills for assessment. In addition, one rater stated to prefer psychometric property of the rating scale since it is consistent. Six raters who preferred to use rubrics expressed that rubrics have specific characteristics such as criteria, providing clear/understandable explanations, enabling to follow a systematic and a clear process, and including all categories of students' answers. In addition, three raters thought that rubrics are consistent. No raters mentioned that they preferred rubrics because it has excellent application property.

Discussion and Future Directions

In this study, it is aimed to examine the scoring tendencies of the raters depending on the assessment method used and to determine which assessment method they prefer and why. Also, the scoring reliability of the raters was estimated with the separation index and the separation index reliability. The analysis was done based on IRT Many Facet Rasch Model. The reliability of the separation index was estimated as .84 for the general evaluation, .79 for the rubric, and .63 for the rating scale. The separation index was estimated as 6.23 in the general evaluation condition, 5.51 in the rubric condition, and 3.94 in the condition where the rating scale was used. High separation index reliability and separation index are desirable for students' level or scoring criteria. However, the low separation index of raters means that the raters have similar scoring tendencies; therefore, it is desirable to have a low separation index and separation index reliability when the raters are in question (McNamara, 1996; Myford & Wolfe, 2004). Accordingly, when the methods are compared, it can be stated that when the general assessment method is used, the raters' behaviours differ, and when the rating scale is used, the raters give similar scorings to each other. Therefore, the most objective evaluation is found to be in the condition of the rating scale.

A significant difference was found between the scoring tendencies of the raters in all three methods. Four of the raters scored significantly lower or higher than the required values when using the general evaluation method. Similarly, four of the raters scored higher or lower when using the rubric method. Only two of the raters scored higher when using the rating scale. It is also found that the number of raters showing significant differences is consistent with the separation index, and separation index reliability of the methods. Raters' tendencies affect the reliability of scorings (Black, 1998). Accordingly, it

is expected that raters that score higher or lower than required should have a lowering effect on scoring reliability. Accordingly, it can be claimed that in the case of using the rating scale, the raters scored more consistently and similarly compared to the other methods. Therefore, the reliability of the scoring with the rating scale is higher. Some studies in the literature also reveal that scoring tendencies of raters may differ and that rater reliability is influenced by rater behaviours such as leniency and severity (Güler, 2014; Brookhart, Walsh, & Zientarski, 2006; Mulqueen, Baker, & Dismuskes, 2000).

Although scoring tendencies of raters cannot be controlled, the reliability of the scoring can be increased by the evaluation method chosen. Giving criteria to raters for the scoring process affects their assessment (Eckes, 2008; Li & Lindsey, 2015; Schaefer, 2008; Tan & Turner, 2015). The fact that no criteria were given during the general evaluation and the different behaviours of the raters under the general evaluation condition support this opinion. The absence of any criteria during the general evaluation required the raters to form their own criteria. As each rater's criteria can be different, their scoring will be different as well. Therefore, the condition with the highest index of separation was the condition where the general evaluation was done.

Rubric tells both teachers and students what is important and what to consider when evaluating. (Arter & McTighe, 2001; Busching, 1998; Perlman, 2003). Therefore, rubrics are the best way to assess complex competencies without compromising reliability and validity (Morrison & Ross, 1998; Wiggins, 1998). Considering that giving criteria to raters will affect evaluation process positively (Eckes, 2008; Eckes, 2012; Li & Lindsey, 2015; Tan & Turner, 2015), it is expected that scoring will be objective when using a rubric. However, in this study, the most objective scoring was obtained when the rating scale was used. It is stated that even if criteria are presented to raters, their tendencies may continue to affect the evaluation process (Cooksey, Freebody, & Wyatt-Smith, 200; Schaefer, 2008). Davidson, Howell, and Hoekema (2000) state that one of the most important reasons why two raters give different scores when it comes to rubric is experience difference. More heterogeneous rater behaviours can be argued to correlate with experience in rating. The difference between raters due to lack of experience cannot be eliminated completely but it can be minimized through trainings on using and developing rubric (Stuhlmann, Daniel, Dellinger, Denny, & Powers, 1999; Weigle, 1999). Rubrics are one of the most commonly used methods for developing and measuring mathematical skills (Shepard, 1989; Wilson, 1993; Anderson & Puckett, 2003; Docktor & Heller, 2009; Gadanidis, 2003; Moskal & Leydens, 2000; Szetela & Nicol, 1992). In order to make the right decisions on mathematical skills of students, measurement processes should be free of errors. Therefore, it should be known that errors caused by raters may be effective in the evaluation of performance tasks or open-ended items. It is argued that using rubrics is the best method in evaluation, so teachers' skills in developing and using rubrics are crucial in case of decisions about students (Romagnano, 2001).

The majority of the raters stated that they preferred rubrics in scoring, but it can be thought that the fact that four raters scored significantly higher or lower than required could be related to their experience with rubric use because the raters in the interviews stated that rubrics are difficult to understand and requires a lot of time while using and developing it. Not having enough experience may make understanding of the explanations in a rubric more difficult (Busching, 1998; Perlman, 2003; Wiggins, 1998). In addition, there are studies showing that although when the standards and criteria of the rubrics are clear, rating scales may be more reliable (Myford, Johnson, Wilkins, Persky, & Michaels, 1996; Penny, Johnson, & Gordon, 2000). In this study, it was also concluded that the most reliable method is the rating scale. The common characteristics are that both rubrics and rating scales include the basic criteria for evaluation. Rubrics also provide explanations to improve objectivity. However, although the raters knew the advantages of rubrics, unity was not achieved at the point of application about objectivity. As a result, their scores with the rubric were observed to be different in the study compared to other studies in the field. It can be claimed that the criteria in the rating scale were perceived by the raters in a similar way. For this reason, more objective evaluations were made when using the rating scale.

Ideally, an assessment should be independent of who does the scoring and the results need to be similar no matter when and where the assessment is carried out, but this is hardly obtainable. Although some traditional item types, for example with multiple-choice questions, meet more rigorous demands and are considered to be reliable, they are criticised for being insufficient in assessing complex performance. The more consistent the scores over different raters and occasions are, the more reliable the assessment is thought to be (Moskal & Leydens, 2000). Giving criteria in the assessment method was partly effective for objectivity. This is why the rating scale provided more objective results than the other two methods in the study. However, although the assessment method was changed, some raters continued to exhibit the same response behaviours. For example, rater 7 and rater 11 gave high scores in all circumstances. Schaefer (2008) states that the characteristics of the raters will affect the scoring regardless of the evaluation criteria. Similarly, Seker (2018) stated that factors such as education level, age, professional experience, and gender can be effective in rater behaviours. It can be argued that personal characteristics are the reason why some raters always have specific tendencies. For this reason, choosing an assessment method with certain criteria and referring to the opinion of more than one rater will provide more objective results.

In the study, problem-solving skills were used as a stimulus when examining rater tendencies. Future research can focus on examining raters' tendencies in assessing different skills and in evaluating different assessment methods such as performance tasks. The findings of the present study reveal that most of the participants prefer to use rubrics and are aware of the advantages of rubrics. The raters' scoring behaviours can be examined following trainings on the use of rubrics that provide them with activities to enhance their experiences. Thus, when rubrics are used for assessment, it can be demonstrated how having an experience of using rubric will affect scoring behaviours. In this study, Many Facet Rasch Model was preferred because individual evaluations were recorded and the raters' leniency/severity were determined. This model is not intended for generalization. A similar study involving a higher number of raters can be conducted grounded on a theory such as Generalizability theory.

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Migration and Immigrants in Social Studies Textbooks (Turkey and US Sample)

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Abstract

In this research, it is discussed how migration and immigrant issues were examined in a comparative way in textbooks in Turkey and the United States. For this purpose, Life Studies and Social Studies textbooks of both countries were determined and of how migration and immigrants in terms were handled comparatively in these books. This research is a descriptive study. Document analysis technique was used for data collection. Both countries are trying to present the concepts of migration and immigrant under the student acquisition and competence related to cultural differences in curriculum. Overall, is the knowledge is given of what kind of migration and immigrant in Turkey's textbooks at the same time it is seen that contact with immigrants and tried to give the idea of integrating them into society to help them streamline their behalf. In the US textbooks, it is seen that the concepts of migration and immigrant are given meaning and the difficulties faced by immigrants are emphasized. More emphasis on immigrants is that they can achieve significant success as a US citizen and maintain their culture comfortably.

Keywords: Migration, Immigrant, Textbook, Problems of Immigrants

Introduction

Migration, which is as old as the history of humanity, is a topic that is recently at the forefront of the whole world. Millions of people have had to migrate for better living conditions due to war and chaos in different parts of the world, especially in the Middle East (Gür, 2017). In addition, individuals and families migrate for purposes of their careers in the increasingly globalized economy. Migration can be defined as a geographic displacement event in which people relocate either temporarily or permanently (Bardsley & Hugo, 2010; Dubey & Mallah, 2015; Hunter, 2005; Kyaing Kyaing, 2013; Lundquist & Massey, 2005). According to the Migration Terms Dictionary of the International Organization for Migration (IOM) migration is formed by crossing an international border or moving within the state. The reason, structure and duration of displacement are all important factors. To think that migration is just an act of displacement is a deficient definition for migration. Migration can be explained by the wishes of people who want a higher standards of living and to realize their hopes and go in different directions for a permanent or temporary change (Aksoy, 2012, p. 293). This migration process consists of displaced persons, refugees and economic migrants (IOM, 2013, p. 22).

Using the United Nations International Migrant report, which measures migration every five years, it is possible to understand the increasing importance of the migration process on global systems. If we look at the change between 2000 and 2015 we see that migration has a very important place in a globalized world. While the number of global migrants was 173 million in 2000, it reached 191 million in 2005, 222 million in 2010 and 244 million in 2015 (UN-International Migration Report, 2015, p. 5). When the above figures are examined, it can be said that the number of international migrants has increased significantly and approximately one in thirty people are migrants around the world. The process of migration has become easier with globalization and technology revolution. However, one of the most important reasons for migration is the desire to escape from the environments of war and to better living conditions.

Beacuse issues of migration are often a contentious political topic, it is important that citizens be well informed as to the causes of migration and the various challenges and opportunities migrants face. Understanding the broader context of migration is crucial in these often vicious debates. That understanding should start at a young age. Research shows that prejudices begin to develop at a very young age (Van Ausdale & Feagin, 2001) and so they must be combated through knowledge and understanding.

Migration, Migration Types and Immigrants

Migration is one of the most important social developments of our age; both resulting from and contributing to globalization. Migration is generally a tool for improving economic and social conditions as well as being considered as a result of economic and social development (Castles, 2000, p. 269; Dubey & Mallah, 2015; Kyaing-Kyaing, 2013; Suarez-Orozco, 2001). Migration is often categorized into different categories on the basis of the immigrant's location and motivation of the immigrant (Skeldon, 1997, p. 57). In addition, key factors such as geographical, legal, political, methodological, temporal as well as the place of birth, citizenship, place of residence and length of stay differentiate the type of migration (IOM, 2018; Şahin, 2001, p. 59; Yılmaz, 2014, p. 1686). It is possible to classify migration according to some criteria, internal and external / international based on area characteristics, temporary and permanent according to time criterion, individual migration and mass migration according to size, voluntary or forced migration according to the reason and legal status criterion (legal) and irregular (illegal) (IOM, 2009, p. 27).

Mobility, which is carried out by displacement within the country and which does not affect the population of the country by changing the population ratio of regions or provinces, can be defined as internal migration (Koçak & Terzi, 2012). External migration, in other words, is defined as international migration, whereby individuals are temporarily or permanently separated from their motherland or from a country where they are permanently resident in order to settle in another country (IOM, 2009, p. 59). There is a distinc-

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tion between legal and illegal migration, or documented and undocumented, where persons or communities are outside their national boundaries, depending on whether or not they go through official channels and visa processes (Emin, 2018). Migration in accordance with their country of origin, country of transit, and the legal procedure for the country of migration is expressed as legal migration. Completing this process by illegal means, in other words, making illegal entry into a country or working illegally is defined as irregular migration (IOM, 2009, p. 21).

Another distinction within migration is individual and mass migrations. Individual migration is the migration that people perform as individuals for a variety of personal reasons (political, economic, education, etc.). Mass migration means that societies or people living in a particular region are displaced for various reasons. The mass migration action can be defined as the movement of a large number of people in an irregular group through an international border at a given time and, as a result, a foreign influx to another country (Akıncı et al., 2015; Emin, 2018). The migration of people in order to survive in other regions and countries by abandoning their places of residence is called continuous migration and can be made both voluntarily and involuntarily. Temporary migrations are; migration to any territory or country for a specific reason at a given time that are short term (Koçak & Terzi, 2012, p. 10; Naz, 2015, p. 20).

Forced migration is when people have to leave their homeland because of various reasons that are outside their control and often against their wishes. Volunteer migrations are migration based on the wishes of individuals for better living conditions and new opportunities (Taş & Özcan, 2013, p. 289). Immigrants in mass and forced migration are more likely to have refugee status. According to the 2018 World Migration Report, it is estimated that in 2015 the number of international migrants was 244 million, which corresponds to 3.3% of the world's population. Internal migration is much more than external migration, and more than 740 million people migrate within their own country, according to IOM (IOM, 2018). There are also 22.5 million refugees registered by the United Nations High Commissioner for Refugees (UNHCR) at the end of 2016 (IOM, 2018).

Challenges Facing Migrants

There are many challenges faced by immigrants. It is possible to differentiate these problems into different categories such as economic, health, cultural, social and educational. Immigrants are generally different in terms of social, cultural, linguistic and religious aspects from the country that accepts them (Castles & Miler, 2008, p. 18). In particular, language differences can make life particularly challenging for immigrants. As immigrants lose the function of their own language in the society they live in, it can have negative emotional and psychological impacts (Erol & Ersever, 2014, p. 53). In the studies that explore the various challenges new immigrants face, legal, economc, employment, health, nutrition and education are among the most serious. (Hall & Cuellar, 2016; IOM, 2013; Landale, Thomas, & Van Hook, 2011; Tienda & Haskins, 2011; Zimmerman, Kiss, & Hossain, 2011). Garrett (2006) lists the most common problems faced by migrants in America: - Problems with the education system, - Business opportunities and housing problems, - isolation and - prejudice, cultural incompetence and discrimination. Garrett in the same study; he says that the difference in the pronunciation of an immigrant implies a better life.

Rubinstein-Avila (2017) described migration as a long-term process and highlighted that migrants will face many different problems by pointing out that crossing a national border is only the beginning for immigrants. One of the biggest problems faced by the immigrants is accessing appropriate education for their children and families. When accessing appropriate education is a challenge, students often experience language problems, low academic achievement, behavior problems and school drop out (Leeman & Ledoux, 2003; Morrice, Shan, & Sprung, 2017; Tienda & Haskins, 2011; Rubinstein-Avila, 2017; Portes & Rivas, 2011; Worbs, 2003,). Rubinstein-Avila (2017) pointed out that the number of immigrant students on a global scale increases every day and that one in four children in the United States was an immigrant, a refugee, or a US born immigrant child, and that teachers and educators should be sensitive about this issue and they should design their teaching to meet the needs of these students. It is also important to know that immigrant children around the world are a growing segment of the school population. Therefore, political initiatives and funding decisions need to be tailored to the specific needs of migrant children. Because if the migratory children are better served today, they will also contribute to the future prosperity of the countries (Suarez-Orozco, 2001, p. 155-156).

Migrants have the power to influence their communities directly and indirectly. The policies developed for immigrants will not only facilitate the adaptation of migrants to the society they live in, but will also provide an opportunity for the country that accepts migration to create added value in all areas, especially in economic and cultural areas. The policies developed during the integration process of migrants are implemented through formal and non-formal education processes. In this process, it is important in materials used as much as educational environments. And with these materials, textbooks play an important role in terms of the processes of adaptation and effective citizenship skills of immigrants, migrants and other students especially in schools. In this research, it is discussed how migration and immigrant issues were examined in a comparative way in textbooks in Turkey and the United States.

Different Migration Contexts: Turkey and the United States

The geographic location of the United States and Turkey play an important role in the number of migrants that enter each country each year and also the type of migrant. In general, most migrants in the United States come for educational and economic opportunity, while the majority in Turkey are refugees fleaing war-torn countries. This is particularly true in the past decade due to the çivil war in Syria. According to a 2016 report there were about 1.6 million foreign born residents in Turkey with an additional 3 million refugees (Bel-Air, 2016). Combined, these two groups made up about 5.8% of the population in Turkey. The United States reached a record high 43.7 million foreign born residents in 2016 making up 13.5% of the U.S. population according to a Pew Research report (López, Bialik, & Radford, 2018). Most of these immigrants are documented (76%) while the rest are unauthorized. Mexico has been the top country of origin, with most migrants coming for economic opportunity while some were fleeing violence. In addition, there have been increasing numbers of migrants from Asian countries, particularly China and India. Currently immigrants of Asian descent make up a higher overall portion of the immigrant community.

Method

In the United States, social studies is the most likely area of study for issues of migration to be addressed. Unfortunately, social studies is under threat in elementary classrooms as time devoted to math and literacy continues to limit time for other subjects (Fitchett & Heafner, 2010). Furthermore, frequently when they do learn social studies it is through children's literatre and/or textbooks (Boyle-Baise et al., 2008). Due to the strictures of state baesd standardized testing in the United States, and the more centralized curriculum in Turkey, using both standards, and standards based textbooks to understand the impact of the social studies curriculum is a valid measure. While not representative of all states, Ohio, in the United States is a politically contested state, meaning it does not tend to be overly conservative or progressive in its state

politics. In addition, it uses the expanding communities approach that many states in the United States use for their elementary social studies standards.

This research is a descriptive study. The document analysis technique was used for data collection. Document analysis uses the examination of written materials with information or facts intended to be investigated (Yıldırım & Şimşek, 2013). Similarly, Patton (2014) stated that the written documents are one of the main methods of obtaining qualitative findings.

In this context, we examined and compared the way migration issues are written about in elementary school textbooks in Turkey and the United States. After preliminary investigations, we decided to use textbooks for grades one through three due to the absence of content related to migration in the grade four textbook in Turkey. Comparative analysis was used with Social Studies textbooks for grades one through three from the United States and Life Studies textbooks for grades one through three from Turkey. The data collected in the textbooks were collected through document analysis. In this context, the determination of the textbooks examined in the United States and Turkey a "criterion sampling" method was used. While criterion sampling was used to determine the subject and to determine the properties of the materials to be analyzed in relation to the subject, easily accessible sampling was used in obtaining the materials. Büyüköztürk et al., (2011) stated that criteria sampling and purposive sampleing are appropriate when researchers want to focus on a particular topic with certain qualifications.

Data Collection and Data Analysis

In this research, we discuss how issues of migration and immigrant are addressed in textbooks from both Turkey and the United States. The data set includes Social Studies textbooks from the state of Ohio in the United States for grades one through three (Berson, Howard, & Salinas, 2007) and life studies textbooks from Turkey for the same grade band (Life Studies 1 Textbook (Demir, 2018), Life Studies 2 Textbook (Kuskaya, 2018) and the Life Studies 3 Textbook (Çelikbaş, Gurel, & Ozcan, 2018).

The content was examined in terms of how migration issues are handled in the textbooks. In addition, when the information was given and students were asked to structure the subject, it was examined which points were emphasized more. Descriptive analysis was used to analyze the research data. We used descriptive analysis in which the data obtained were summarized and interpreted according to previously determined themes and in the context of cause-effect relations (Yıldırım & Şimşek, 2013). Descriptive analysis technique was carried out in the framework of three activity steps; reduction of data, presentation of data, conclusion and verification (Türnüklü, 2000). Textbooks examined in this research; were examined by limiting data to the subject of migration, how the issue of migration is addressed the characteristics of the migrants presented in the textbook, which activity and evaluation processes were presented with the presentation of the examples and the similarities and differences between the textbooks were evaluated (The data obtained in the content analysis were evaluated by taking the opinions of two experts who completed their PhD in the field of Social Studies education in the US).

Determining which pages were related to migration was challenging, particularly with the textbooks from the United States. While there were pages that explitily addressed migration both in the past and the present using the word “immigrant” and directly discussing not only the challenges immigrants face but also the diversity they bring, there were other sections of the text that also talked about people coming from Europe to what is now known as the United States where the people were refered to as “settlers” or “colonists.” These sections also discussed the challenges of coming to a new and unfamiliar land and highlighted the ways in which the Native Americans helped these immigrants adjust to life in North America. However, again, this group of people is refered to not as immigrants but as settlers or colonists. After the arrival of the settler immigrants is mentioned, Native Americans are never mentioned again. While this is an important factor to consider, for the purposes of this manuscript we are only considering time when migration and immigrants are expliticlty mentioned.

Results and Recommendations

Before looking at how immigrants and migration are included in the textbooks, we examined how the student competences, or standards, related to these issues are or are not present in the relevant curriculums of both countries. The subjects of migration and immigrants are included in the competence of students in Turkey at every grade level. In the US, migration and immigrants are addressed tangentially under the emphasis of recognizing cultural differences and individual characteristics and rights. Additional standards for Ohio that are less direct, but could include addressing challenges of migration and immigrants are included in italics. Shown below are issues of migration as found in grade-level competencies in Turkey and Ohio (United States) standards:

Life Studies Curriculum in Turkey (MEBa, 2018):

> HB.1.5.4. Realize living in our country together with people from different cultures.
>
> The subject, is explained by the people who have migrated from their countries compulsorily or voluntarily.
>
> HB. 2.5.7. It respects the life styles and habits of people in different cultures living in our country.
>
> The subject is explained by the people who have migrated from their countries compulsorily or voluntarily.
>
> HB. 3.5.7. Participates in social responsibility projects for the problems of people in different cultures living in our country.

Social Studies Standarts 1-3 (Ohio’s learning standards: Social Studies: OLSSS, 2018):

> Grade One:
>
> 6. Families interact with the physical evironment differently in different times and places.
>
> 7. Diverse cultural practices address basic human needs in various ways and may change over time.
>
> 8. Individuals have responsibility to take action toward the achievemet of common goals in homes, schools and communities and are accountable for those actions.
>
> 9. Collaboration requires group members to respect the rights and opinions of others.
>
> Grade Two:
>
> 6. The work that people do is impacted by the distinctive human and physical characteristscs in the place where they live.

8. Cultures develop in unique ways, in part through the influence of the physical environment.

9. Interactions among cultures lead to sharing ways of life.

Grade Three:

8. Communities may include diverse cultural groups.

When these competencies/standards are considered, it is understood that the emphasis on coexistence and cultural richness is aimed at attracting the attention of the students to the concepts of migration and immigrants.

In this section, we present the content around migration issues in Turkey and US textbooks according to grade levels. Below are the rates at which issues of migration are discussed in the textbooks in Turkey and US.

Table 1. *Migration and Immigrant in Turkey and US Textbooks*

Textbooks	Title	Total number of pages	In % of all textbook pages
Life Studies 1	Living Together	2	1
Life Studies 2	Different Cultures, Different People	3	1.2
Life Studies 3	New Country, New Friends	2	1
Social Studies, A Child' View	People Find New Homes, Expressing Culture, Sharing Celebrations	23	7.5
Social Studies, People We Know	Many People, One Country, Celebrating Culture	16	5
Social Studies, Our Communities	Moving to New Places, Sharing Cultures	15	3.4

When the table is analyzed, 3.4-7.5% of the Turkish textbooks discuss migration and 1-1.2% of the US textbook addresses these issues. This would indicate that Turkey devotes a higher percentage of its textbook content to issues of migration than the United States.

Migration and Immigrants in First Grade Textbooks

In the Life Studies 1 textbook, the issue of migration and immigrants is explained under the title "Living Together".

With the subject of Living Together, it was intented to tell first year students that people from different nationalities live together and explore the subject of migration at the same time. Through the speech balloons, students were asked to introduce themselves and explain why they came to Turkey. Three students from Germany, Afghanistan and Syria have described their experiences as immigrants in Turkey. Especially making emphasis to migration in the speech bubble, is now made particularly emphasized that Turkey is their homeland. This situation is seen as an effort to accept the new countries that immigrants have to live in and to accelerate the process of getting used to easier. Another noteworthy transmission was the students' speaking of Turkish, recognizing the geographic locations of the country and their relations with the people of the country. At the beginning of the subject, there is a directive in the form of the preparation question to share the knowledge of whether there are migrants in their immediate vicinity or where they live. In the second page of the student activity, the definition of migration is included and performance tasks are given to help the immigrants and reveal the importance of living together. In the Life Studies grade 1 textbook, It was noted that there is an attempt to give information about migration and to help them communicate with migrants and to integrate with their community.

Figure 1. Subject of migration and immigrants in Life Studies Grade 1 textbooks in Turkey

Figure 2. Subject of migration and immigrants in Social Studies Grade 1 textbooks in US-a

Migration and immigrant subjects in the US 1st Grade Social Studies textbook are described in People Find New Homes. The lives of four immigrants from India, El Salvador, Russia and Kenya were described in American society. The definition of the immigrant and the question of preparation have been started with the aim of discussing what the immigrants contribute culturally to society.

Figure 3. Subject of migration and immigrants in Social Studies Grade 1 textbooks in US-b

Examples of migrant families' lives in the community and their work in the US are given. At the same time, the sample families selected from four different countries continue their culture and also gain some of their achievements in their homeland; it is seen that the emphasis is on traditional art and education.

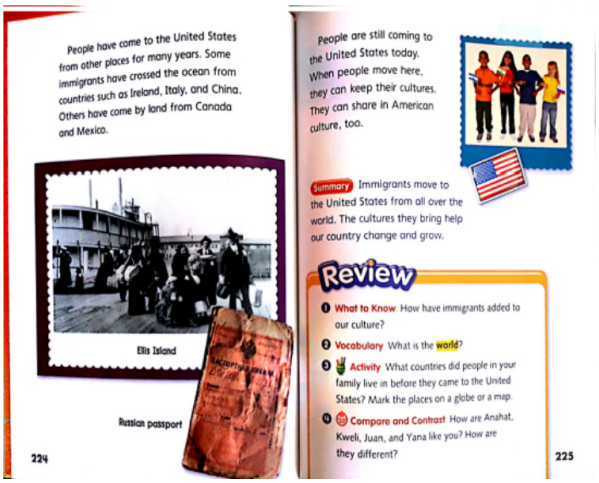


Figure 4. Subject of migration and immigrants in Social Studies Grade 1 textbooks in US-c

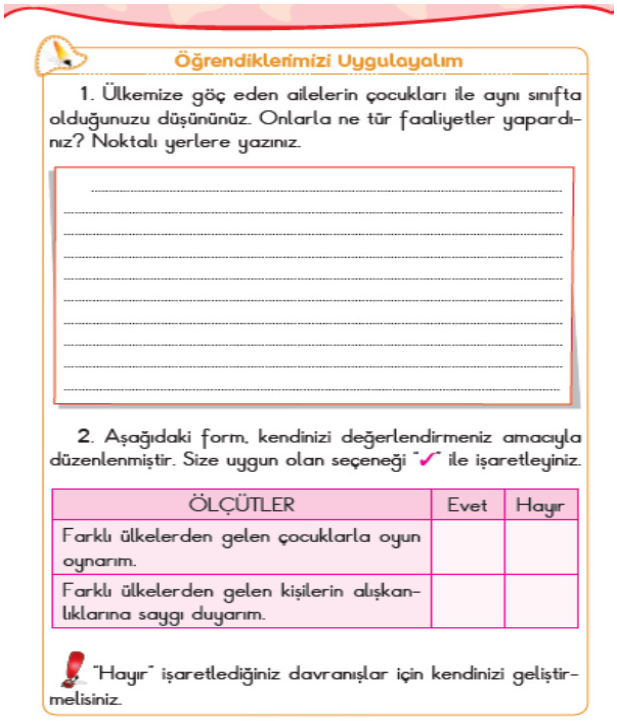
In the continuation of the issue, it was emphasized that immigrants came to the US from other countries, many years ago, some immigrants came from overseas countries and even today some migrants arrived. The fact that immigrants came to the US created a cultural richness and underlined that the migrants were protecting their own culture. At the end of the subject, it was asked that migrants carry cultures from different regions of the world to the US and that this was a cultural wealth, and also their students would be an immigrant and to investigate where they came from. In this continuation (p. 226-230) cultural differences are mentioned and it is explained that the US is a rich immigrant country and it continues with the transfer of people from different cultures as migrants in the US. In the US Social Studies 1 textbook, it is seen that the information about migration and immigrant is explained in terms of the subject matter of migration and immigrants. The more emphasis on migrants is that they have a culture of their own and that this is a cultural wealth for the US. At the same time, it is emphasized that there is a historical process of migration and that it continues after the case studies.

Migration and Immigrants in Second Grade Textbooks

In the Life Studies 2 textbook, the issue of migration and immigrants is explained under the title "Different Cultures, Different People"

Figure 5. Subject of migration and immigrants in Life Studies Grade 2 textbooks in Turkey-a

In the second grade textbook, it is seen that the migration and immigrant concepts are pointed out by giving speech to the children of different migrants as in the first grade. It is seen that two students of the same grade are included in the topic. The first student "Mert" is Turkish and his classmate "Mahmut" is Syrian. When Mert said welcome to Mahmut, Mahmut said that he migrated from Syria. Subjects continued on, because the causes of migration and migrants from different countries in Turkey and mentions the necessity to help them. On the other page where a student's neighbors emigrated from Turkmenistan to Turkey for educational purposes while other students are seen as giving place to talk with a Japanese friend living in Turkey due to his father's job.



Öğrendiklerimizi Uygulayalım

1. Ülkemize göç eden ailelerin çocukları ile aynı sınıfta olduğunuzu düşününüz. Onlarla ne tür faaliyetler yapardınız? Noktalı yerlere yazınız.

2. Aşağıdaki form, kendinizi değerlendirmeniz amacıyla düzenlenmiştir. Size uygun olan seçeneği "✓" ile işaretleyiniz.

ÖLÇÜTLER	Evet	Hayır
Farklı ülkelerden gelen çocuklarla oyun oynarım.		
Farklı ülkelerden gelen kişilerin alışkanlıklarına saygı duyarım.		

"Hayır" işaretlediğiniz davranışlar için kendinizi geliştirmelisiniz.

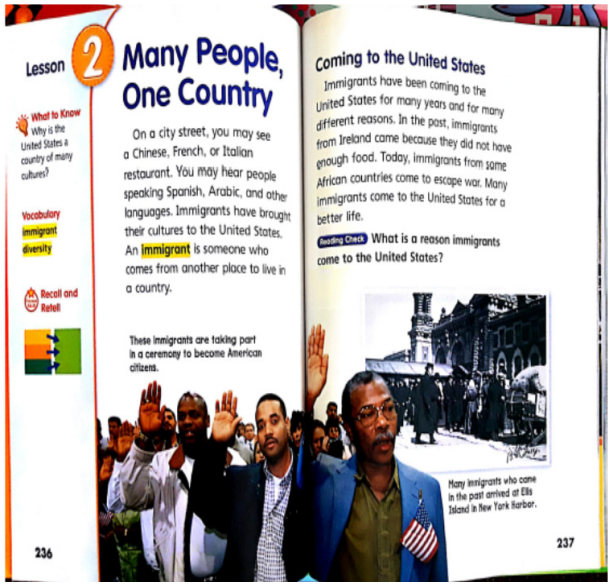
Figure 6. Subject of migration and immigrants in Life Studies Grade 2 textbooks in Turkey-b

In the end-of-term evaluation section, we see that two different performance tasks are given to the students. First, they are asked to imagine that they are immigrant students in their classrooms and to plan how they can do joint activities with other students. The second task is to complete the attitude scale towards immigrants with two items.

In this attitude scale, there are two items: immigrants, playing with students and respecting their habits. Students who have negative answers are asked to improve themselves positively by questioning these behaviors.

When we look at the subject matter of migration and migrants in the Life Studies 2 grade textbook, it is evident that the idea of migration and its types and communication with migrants and helping them to facilitate their integration with society are tried to be given as in the first grade. It is seen that this class level focuses on the idea of coexistence with migrants and the idea of living together in society, rather than the explanations given at the knowledge level.

"Many People, One Country "subject of migration and migrants was addressed in US 2nd Grade Social Studies textbook. The subject was introduced to the students with an example that can be seen frequently in American society. Restaurants from different cultures on a Street; You can see the French, Italian and Chinese restaurants and the issue is raised by saying that you can see that people speak Arabic, Spanish and other languages. The reasons for the migration of an immigrant; malnutrition, war escape etc. are explained with examples. At the same time, the book explained that America is a country that has been receiving immigrants for many years. In the visuals used, it is emphasized that the immigrants are compatible with US citizens and it tries to show that the immigrants have been coming to America for a long time.



Lesson 2 Many People, One Country

What to Know: Why is the United States a country of many cultures?

Vocabulary: immigrant, diversity

Recall and Retell

On a city street, you may see a Chinese, French, or Italian restaurant. You may hear people speaking Spanish, Arabic, and other languages. Immigrants have brought their cultures to the United States. An immigrant is someone who comes from another place to live in a country.

These immigrants are taking part in a ceremony to become American citizens.

Coming to the United States

Immigrants have been coming to the United States for many years and for many different reasons. In the past, immigrants from Ireland came because they did not have enough food. Today, immigrants from some African countries come to escape war. Many immigrants come to the United States for a better life.

Reading Check What is a reason immigrants come to the United States?

Many immigrants who came in the past arrived at Ellis Island in New York Harbor.

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Figure 7. Subject of migration and immigrants in Social Studies Grade 2 textbooks in US-a

Cultural Differences

At first, life in a new country is hard. Immigrants have to find new homes and new jobs. They may have to learn a new language and new ways of doing things.

As immigrants learn about the culture of their new country, they also keep their own culture. They pass on their old ways of doing things to their children and grandchildren.

People in this community keep up their Chinese language and culture.

Dhanya's parents are from India. Her father plays Indian songs on a sitar, a stringed instrument. For many Indian celebrations, Dhanya wears a colorful dress called a sari.

Anthony's family loves to get together with neighbors to play bocce ball. Bocce ball is a game that is played in Italy. Anthony's grandfather taught him how to play.

Reading Check Recall and Retell

What makes life hard at first in a new country?

Figure 8. Subject of migration and immigrants in Social Studies Grade 2 textbooks in US-b

In the continuation of the issue, it is seen that the difficulties faced by immigrants coming to a new country were emphasized. New home, new job, learning a new language and many new things are emphasized that are difficult for immigrants. At the same time, it is explained that immigrants adapt to the new culture without forgetting their own culture and this takes a long time. It was also seen that different examples from Italy and India were emphasized in the US society in terms of living their own culture and being together.

It was emphasized that the immigrants in the US created a cultural diversity with their food, music, clothes, language and beliefs and thus opened the way for learning different ideas.

In the US, people are said to be Americans and everyone is equal and free, even if they are from different cultures.

Figure 9. Subject of migration and immigrants in Social Studies Grade 2 textbooks in US-c

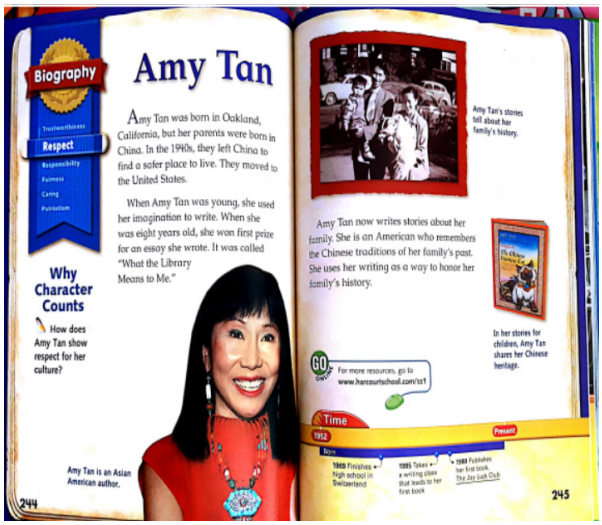


Figure 10. Subject of migration and immigrants in Social Studies Grade 2 textbooks in US-d

The US Social Studies 2 textbook continued with sample success stories and biographies of migrants, and special day celebrations of different cultures were included. As in the example above, the story of Amy Tan, a Chinese immigrant, has been told about her success story as an immigrant at a very young age. It was also emphasized that immigrants are equal in society and at the same time they are not different because the come from other country.

In the US Social Studies 2 textbook, it appears that the meaning of the concepts of migration and immigrant and the difficulties experienced by immigrants are considered when the subject matter of migration and immigrants is examined. More emphasis is put upon how migrants can achieve significant success as a US citizen and can continue their culture comfortably. It is seen that the real visual materials and sample stories and the idea of living together in harmony with the society are especially emphasized. It is noteworthy that cultural differences are an important variety and richness for the US and that every citizen has equal rights.

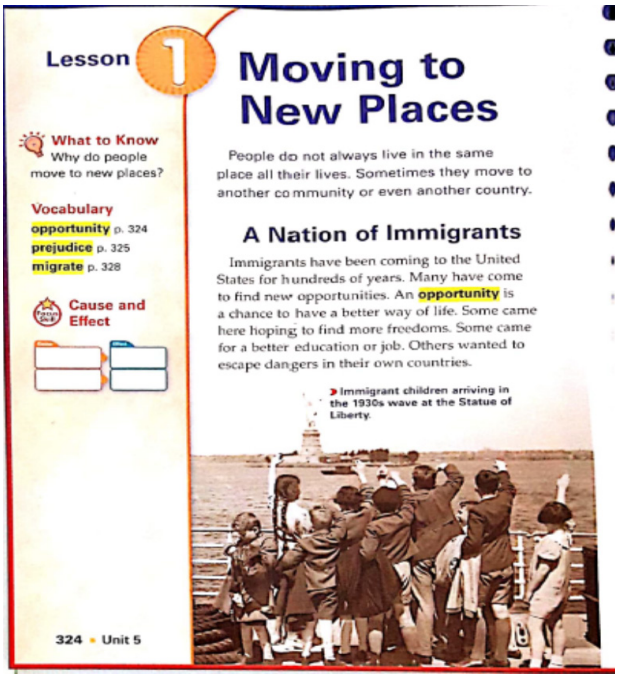
Migration and Immigrants in Third Grade Textbooks

In the Life Studies 3 textbook, the issue of migration and immigrants is explained under the title "New Country, New Friends".

Figure 11. Subject of migration and immigrants in Life Studies Grade 3 textbooks in Turkey

In the third grade textbook, it is seen that the content of the subject of migration and immigrants are addressed through a story. A child standing alone in the park does not know the language and did not participate in the games, but later an immigrant child with a little knowledge of the language helps the other child to play with the group. As a result of bringing together children from different cultures, cooperation has been shown to be a natural result. Again, on the activity page, an immigrant student who did not speak a language was asked to say what could be done to adapt to the school. Finally, the students were asked to think about what they would feel if they were an immigrant.

When we look at the content of migration and immigrant subjects in the Life Science Grade 3 textbook the reasons for migration are explained and the situation of immigrants in society is explored as in the first two grades. At the same time, they tried to explain what they felt through empathy. It is evident that migration and immigrant subjects are handled in Life Science textbooks in a similar way in the first three grades, and that there is a difference in the level of knowledge and understanding of migration and migrants. The problems experienced by the immigrants, the processes of integration with the society, cultural differences and their harmony in a new country, their identity and being a member of a new country and how it is difficult to get together are not explained. In the visual materials used, it is evident that a scenario based on the appropriate drawing was made and real visual elements were not used. It was also observed that the performance tasks given in the end-of-term evaluations were very important for adopting the idea of empathy and coexistence in society.


Lesson 1

Moving to New Places

What to Know
Why do people move to new places?

Vocabulary
opportunity p. 324
prejudice p. 325
migrate p. 328

Cause and Effect

People do not always live in the same place all their lives. Sometimes they move to another community or even another country.

A Nation of Immigrants

Immigrants have been coming to the United States for hundreds of years. Many have come to find new opportunities. An opportunity is a chance to have a better way of life. Some came here hoping to find more freedoms. Some came for a better education or job. Others wanted to escape dangers in their own countries.

Immigrant children arriving in the 1930s wave at the Statue of Liberty.

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Figure 12. Subject of migration and immigrants in Social Studies Grade 3 textbooks in US-a

Migration and migration issues in the US and 3rd Grade Social Studies textbook; were explained with "Moving to New Places and Sharing Culture" topics. Moving to New Places has explained the reasons for migrants to migrate to the US. It explained that they migrated to the US for a better life, education and employment opportunities. Migration from the other continents of all continents is given by the migration map. In the third grade textbook, the difficulties faced by the immigrants is described in more detail than in the other two classes that were included. It is stated that migrants live a more difficult life in terms of housing, making money and feeding.

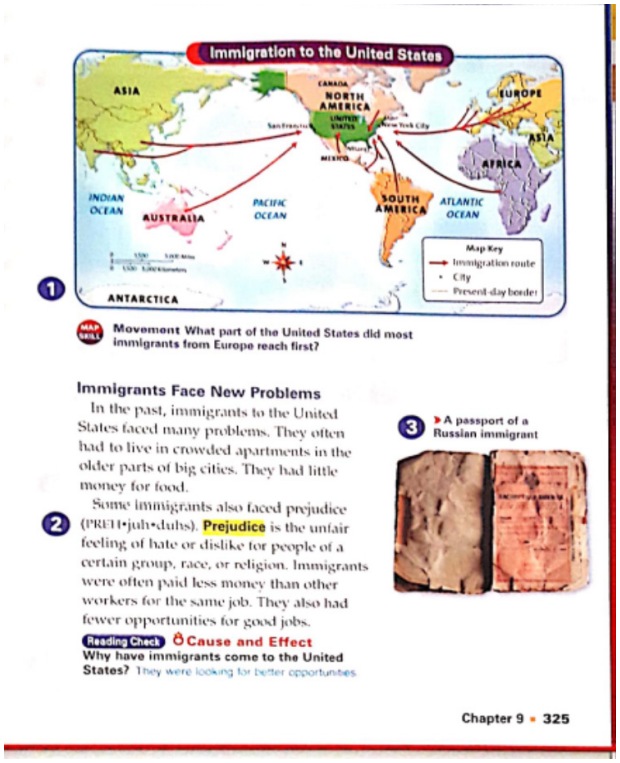
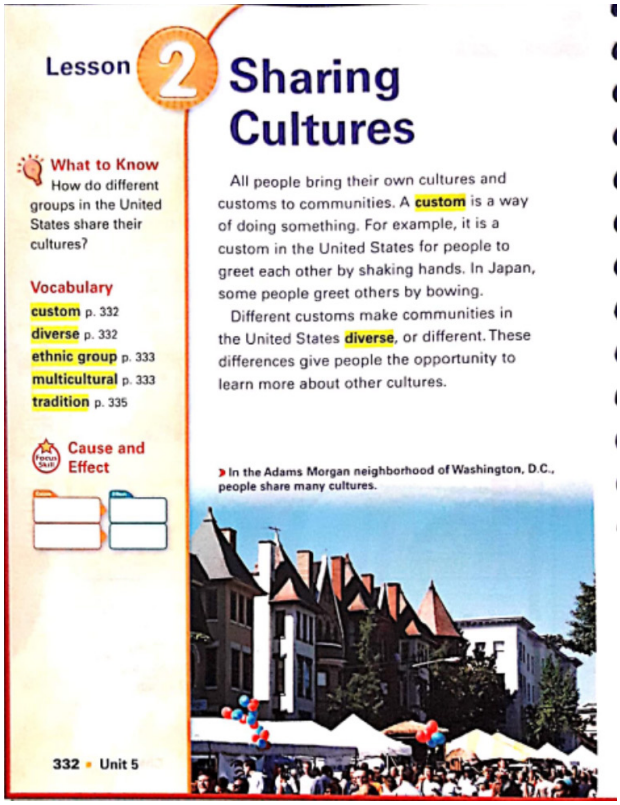


Figure 13. Subject of migration and immigrants in Social Studies Grade 3 textbooks in US-b


Lesson 2

Sharing Cultures

What to Know
How do different groups in the United States share their cultures?

Vocabulary
custom p. 332
diverse p. 332
ethnic group p. 333
multicultural p. 333
tradition p. 335

Cause and Effect

All people bring their own cultures and customs to communities. A custom is a way of doing something. For example, it is a custom in the United States for people to greet each other by shaking hands. In Japan, some people greet others by bowing.

Different customs make communities in the United States diverse, or different. These differences give people the opportunity to learn more about other cultures.

In the Adams Morgan neighborhood of Washington, D.C., people share many cultures.

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Figure 14. Subject of migration and immigrants in Social Studies Grade 3 textbooks in US-c

Another subject related to migrants in the third class textbook is the "Sharing Cultures" topic. It is explained that people from different cultures form cultural diversity and wealth, and that multicultural neighbor relations prevail in cities. Again, a grocery photo from a small city from Georgia was shared; Although this city is very small, it is emphasized that it has a great ethnic diversity.

Figure 15. Subject of migration and immigrants in Social Studies Grade 3 textbooks in US-d

Discussion, Conclusion And Suggestions

In this research, it is discussed how migration and immigrant issues were examined in a comparative way in textbooks in Turkey and the United States. For this purpose, Life Studies and Social Studies textbooks of both countries were examined in terms of how migration and migrants were handled comparatively in these books. In the Life Studies and Social Studies courses, which aim to develop effective citizenship in society, to culture and aim to become an individual member of the society, adopted as migration societies USA's, and Turkey's which especially in the last five years, accepts only about 3.6 million immigrants (Göç Idaresi, 2019) from Syria, at elementary level, it is extremely important to reveal how discusses issues of migration and immigrants.

Turkey and the US curriculum, the issue of migration and immigrants, has in the competencies related to cultural differences. In the Turkey's curriculums which is more central than USA, there are explanations about the migration and immigrants and said that this orientation takes place on the subject of direct routing of content to cover relevant issues in light of textbooks. In the US social studies curriculum, the issue of cultural differences was more open-ended, where textbook users were given the opportunity to further link and elaborate on the issue. In Turkey, a Life Studies curriculum (MEBa, 2018) of migration and immigrant issues at every grade level have been found especially highlighted. In the US social studies curriculum (Ohio Department of Education, 2017)., there is no explanation for direct migration and immigrants. Cultural differences and coexistence were observed as two different competences at each grade level.

While there are many studies on migration and migrants, it can be said that there are limited studies investigating how migrants are handled in textbooks (Hintermann, 2009; Soysal, 2005). A study by Hintermann (2009) on Migration and Memory in Austria, and a Reluctant Migration Country in Austria reveals how migration and migration are handled, especially in history (Social Studies textbooks are included) and geography textbooks. In 8 books examined in this study, migration and migrants were included between 0.6% and 4.9% in the total of books. It is determined that the subject is given in the headings "New problem: language of migrants, Migration today, Problems of migration, The richest and the poorest countries in the World, Change of society etc." In this research the migration and immigrant issues in Turkey and US textbooks "Live Together, Different Cultures, Different People, New Country New Friends, Many People, One Country, People Finder New Homes" are given under subject headings. The total manual migration and migration issues in Turkey 1% to 1.29% 'is also covered by the US it is seen that incorporation of the total book 3.4% to 7.5%. According to Hintermann (2009) the subject of immigrants in textbooks; focuses on the adaptation processes of migrants, working conditions and problems. This similar to the contents in the Life Studies textbooks in Turkey. In the US, however, it can be said that the content of the subject in terms of immigrants focuses on the cultural richness and the preservation and preservation of their culture by covering migrant problems and historical processes.

Life Studies Grade 1 textbooks (Demir, 2018) in Turkey, has only one topic under the concept of migration and immigrant. The content of the subject was determined by the knowledge of migration and immigrants, and the idea of communicating with the Immigrants and helping them to facilitate their integration with society. The information contained in the textbook focuses on assisting immigrants in the process of adaptation to society, particularly in studies related to migration and migrants. In the literature, it is seen that the biggest problem experienced by migrants is their living conditions and adaptation problems. Based on both living conditions and adaptation problems, it is stated that family communication and school life of children are affected (Chuang & Gielen, 2009; Browne et al, 2017; Davies & McKelvey, 1998; Stodolska, 2008). In the US Social Studies Grade 1 textbook (Berson, Howard, & Salinas, 2007), when we look at the subject matter related to immigrants and immigrants, it is seen that first of all, migration and immigrant are given. It can be said that the textbook tries to make students comprehend these ideas from a young age, considering the willingness of host countries to help migrants and to be seen as part of society. More emphasis on migrants is the idea that they have a culture of their own and that they maintain it, and that this is a cultural wealth for the US. At the same time, a historical process of migration has been emphasized and the emphasis is evident in the case studies used in the texts. The information contained in the textbooks shows that in many studies (Bhugra & Becker, 2005; Ojeda, Flores, Rosales, & Morales, 2011; Bhugra, 2004), migrants' desire to protect their cultural identities and its support is important for facilitating the process of adaptation to the communities in which they live.

Migration and immigrant issues, in the Life Studies Grade 2 textbooks (Kuşkaya, 2018) in Turkey, has been seen only in one subject. When the content of the subject is examined, it is seen that the idea of migrants and their communication with the immigrants and the idea of helping them to facilitate their integration with the community is just same as in the first grade. In this grade, rather than the explanations given at the level of knowledge, it is observed that the focus is on the idea of living together and facilitating the adaptation process of migrants with performance tasks. The idea of living together in this textbook and student study activity and seeing migrants as part of the society is extremely important. However, the fact that it is only under one topic shows that this issue is given limited attention.

In the US Social Studies 2 textbook (Berson, Howard, & Salinas, 2007), when we look at the subject matter related to immigrants and migrants, we see that they use rich information content and examples, more so than the first grade textbook. In the same way, it is possible to say that the US Social Studies 2 textbook is given a richer transfer process

according to the content of the Life Studies 2 textbook. The Social Studies Grade 2 textbook shows an emphasis on the meaning of the concepts of migration and immigrant and the difficulties experienced by immigrants. A more recent emphasis on migrants is that they can achieve considerable success as a US citizen and can continue their culture comfortably. It is seen that the real visual materials and sample stories and the idea of living together in harmony with society are especially emphasized. It is noteworthy that cultural differences are an important element in the US textbooks and that every citizen has equal rights. Most research on migrants state is that they are faced with many new situations in society, and these are seen as major challenges in the lives of migrants (Hall & Cuellar, 2016; IOM, 2013; Landale, Thomas, & Van Hook, 2011; Zimmerman, Kiss, & Hossain, 2011;). The Social Studies Grade 2 textbook draws attention to these challenges. At the same time, adapting to the society in a healthier way, bringing its cultural awareness to life together with the process of harmonization with the new culture provides a healthy adaptation process for migrants (Bhugra, 2004; Bhugra & Becker, 2005; Kaushik, & Drolet, 2018). In the textbook, these issues are addressed with real visual elements and life stories. When we look at the subject matter of migration and immigrants in the Life Studies Grade 3 textbook; As in the first two grades, migration and the causes of migration and the situation of immigrants in society are given. At the same time, the empathy of the migrants was established and their feelings were tried to be explained. In the course book, in particular through empathy with performance tasks and recognizing the problems of immigrants, The issue of assisting them, the concern of immigrants being admitted to the new society, will help the migrants to overcome their psychological problems more easily (Alegría, Álvarez, & Di Marzio, 2017; Kirmayer et al., 2011; Mood, Jonsson & Låftman, 2016). And it will further strengthen the idea of coexistence among future generations of society.
In the US Social Studies 3 textbook, migration and migrants have been described in relation to the issue of cultural diversity as in other books. In this book, unlike the other two classes, more attention was paid to the problems experienced by migrants. In addition, some statistics on migration movements and immigrants from different continents are included in the USA. In addition, it continued to be emphasized, as in the other two books, that immigrants living in American cities moved their culture to their new countries and that this was a source of wealth for the US.

Another important point in the textbooks of both countries is the visual materials used in books. In Turkey, more pictures (drawings made based on the scenario) were used, the US textbooks used more real visual evidence such as photographs. If the real visual elements used in textbooks are thought to affect the learning process more favourably, more real visual materials are recommended to benefit in Turkey textbooks. As a result of this study, there are many studies on migration and migrants in the literature, but there is limited research on the subject of immigrants in the textbooks. A historical process can be screened in the textbooks about immigrants. In the historical process, it can be investigated how the migration and migratory expression has changed. Again with regard to immigrants, first-middle and high school textbooks, especially in social studies, history and geography courses; research can be carried out on how to present a topic content. Also in the research, integration processes of immigrants in Turkey is evident mostly at elementary level, and there is a particularly emphasis on communication with migrant issues. While preparing the course book, immigrant rights related to immigrants and migrants, successful migrant stories and their importance for both their own countries and the society they live in could be expressed. The opportunities provided by the migrant country can be explained from the perspective of the migrants. Assuming that migration is an international issue, examples of experiences of migrants and migrants of each country in a globalized world can be explained briefly

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Graphic Symbol Based Interactive Animation Development Process for Deaf or Hard of Hearing Students

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Abstract

This study examined the development process of graphic symbol-based animations for enhancing literacy skills of deaf or hard of hearing students (D/HH). Participants of the study consisted of two teachers and seven students studying in the third and fourth grade in a primary school for hard of hearing. As a result of the studies conducted throughout the fall and spring semesters, animation environments based on graphic symbols were developed. Within the framework of the design-based research methodology, development studies were followed by revisions. Revision studies were conducted in line with the data obtained from the interviews and observation notes that continued throughout the practices. A content analysis was utilized to examine the data obtained through interview and observation. It has been determined that; in the animations each sentence should be presented clearly and it may be paused if necessary, minor details and the dormant objects in the background should be removed, animations of actions should be standardized, and fonts in animations should match the writing style used by the students in the animations. As a result of the study, a design guide for graphic symbols-based animations for D/HH were developed for the researchers in line with the acquired results

Keywords: Deaf or Hard of Hearing (D/HH), Education, Symbols-Based Animation

Introduction

The inability to perceive auditory signals coming from the environment and the inability to respond to signals because of hearing loss negatively affect the social and language development of individuals (Bowers, Dostal, Wolbers, & Graham, 2018; Cavkaytar & Diken, 2005; MEB, 2006). Developmental problems caused by hearing loss affect the academic achievement, the development of perceptual skills, and the cognitive progress of students negatively (Akmeşe, Sezgin, & Öğüt, 2019; Rudner et al., 2015; Tüfekçioğlu, 1998). It is reported that a significant majority of deaf or hard of hearing (D/HH) students lag at least five years behind compared with their peers in the educational environment because of the problems they face with regard to literacy education (Kyle & Harris, 2006). It is also stated that even the literacy skills of adults do not exceed the fourth-grade level (Dillon, de Jong, & Pisoni, 2012).

Studies conducted on D/HH students asserted that they are deprived of natural language inputs (Scott, Goldberg, McDonald-Connor, & Lederberg, 2019; Lederberg, Schick & Spencer, 2013; Pınar, 2006; Tüfekçioğlu, 1998) and therefore experienced problems in critical periods of language acquisition (Scott & Dostal, 2019; Marschark et al., 2009), that their communication with their families is limited (Turnbull, Turnbull, Wehmeyer, & Shogren, 2013), that they do not have adequate and appropriate educational and instructional programs (Turnbull et al., 2013), and that they frequently miss social cues in their surroundings (Cole, Cutler, Thobro, & Haas, 2009). It is recommended that learning environments be developed that will be designed with consideration of the special needs of the D/HH students, will help eliminate their disadvantageous situations and will provide for equality of opportunity in education (Cruz, 2013).

When the learning environment is being designed for students with hearing problems, it requires a more difficult process, compared with their typical peers. Studies conducted for the evaluation of the learner characteristics of students with hearing problems reveal that these students can be dealt with as visual learners (Chen, 2014) and that the use of visual materials is important (Nikolaraizi, Vekiri, & Easterbrooks, 2013; Reitsma, 2009). It is necessary to place particular importance on the choice and presentation of visual stimulants in materials to be developed for D/HH students, whose attention is generally in a visual direction, and who can more easily notice visual stimulants than their peers (Türköz-Sarp, 2013). At this point, researchers who conduct technology-supported studies in the field of special education described technology as a universal equaliser (Amiel & Reeves, 2008; Ellis & Kent, 2011; Foley & Ferri, 2012; Singh & Mahapatra, 2019). Multimedia materials supported with information and communication technologies presenting information in a visual format (Şılbır, 2011; Hoffman, & Wang, 2010; Luckner & Cooke, 2010) and allowing individuals to more actively use multiple contents and contexts in their cognitive processes are seen as an opportunity for the education of the D/HH students (Marschark & Knoors, 2012; Snoddon, 2010; Ünlüer, 2010), because these types of materials (videos, images, animations, graphic symbols) have a rich interaction of content and are easily expressed linguis-

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tically (Gentry, Chinn, & Moulton, 2004). Materials supported with visuals are helpful in ensuring that D/HH students more easily understand the words, increasing their literacy skills, and earning them motivation for reading (Nikolaraizi & Vekiri, 2012, Paudyal, Banerjee, Hu, & Gupta, 2019). That is why it is necessary to pay attention to the choice of visuals to be used in the education of the D/HH, where the use of visuals is prioritised. It is important that these visuals that will be used are prepared for the individual characteristics and educational needs of D/HH students.

Graphic symbols are defined as figures that can be perceived visually and transmit information independently from the language (ISO 17724:2003). Fuller and Lloyd (1991), who studied graphic symbols, emphasised the term iconicity as being nearly transparent between a plane with one transparent side and one opaque side. Previously conducted studies show that iconicity is effective for the understanding of graphic symbols by D/HH students (Mollink, Hermans, & Knoors, 2008; Tolar, Lederberg, Gokhale, & Tomasello, 2008). The studies on the current graphic symbol systems revealed that they used simple colours (generally black and white), avoiding complex drawings, and graphic symbols contained only one concept (Tucker-Cohen, Allgood, Heller, & Castelle, 2001; Trudeau, Sutton, Dagenais, De Broeck, & Morford, 2007). Some examples of graphic symbol systems are seen in Figure 1.

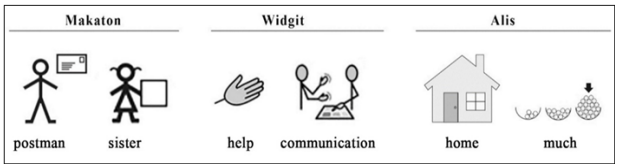

Figure 1. Examples of Graphic Symbol Systems

Besides the graphic symbols, multimedia materials such as video, animation, and AR books are also used in educational environments of D/HH students. When the studies of these materials are examined, it is seen that different features are used in different studies but not standardized. In the animations, using simple drawings, audio, and subtitle support is proposed (Cambra, Penacchio, Silvestre, & Leal, 2014; Lányi, Váry, Sik, Nemetz, & Geiszt, 2004). Furthermore, many researchers evaluated the use of a sign language translation over an educational material as an animation (Jemni, Elghoul, & Makhloufet, 2007; Kaneko, Hamaguchi, Doke, & Inoue, 2010; Kipp, Heloir, & Nguyen, 2011; Kourbetis, 2013). Zainuddin, Zaman and Ahmad (2010) determined that when taking into consideration the visual learning needs of students, AR book materials should include the following features: colourful and simply drawn graphic symbols, short texts, texts presented with appropriate graphics, an environment supported with sign language, and 2D or 3D models. When considering the design recommendations made for the videos, it was reported that subtitles needed to be added to the videos and that understandable and simple texts needed to be used (Debevc, Kosec, & Holzinger, 2010; Jensema, Danturthi, & Burch, 2000; Talaván, 2019). On the other hand, in independent studies that referred to multimedia materials, iconic graphic designs, providing audio support, presenting text and visuals together, context-essential content, text-symbol-sign language compliance, adding subtitles, user-centred design, and the inclusion of sign language translations was recommended (Gatti, Matteucci, & Sbattella, 2004; Gentry et al., 2004; Mayer & Moreno, 2003; Petrie, Weber, & Fisher, 2005; Techaraungrong, Suksakulchai, Kaewprapan, & Murphy, 2017). The design recommendations of the different studies in the literature are summarised in Table 1.

In these studies, different design features or different components are mentioned for animations. However, it is unclear whether these design features or components should be used together. There is also no evidence regarding how the designs should be structured in the case of the combined use of these components. At this point, it is necessary to determine the components and design features of the animations to be used in the educational environments of hearing-impaired individuals.

Table 1. *Materials and Design Recommendations Developed for the Hearing Impaired.*

Design Suggestion	Animation	AR Book	Multimedia materials	Video
Simple drawings	X	X		
Iconic graphic designs			X	
Colourful visuals		X		
Sound support	X		X	
Presenting text and visuals together			X	
Context-based contents		X	X	
Text, symbols, and sign language compatibility		X	X	
Using subtitles	X		X	X
Understandable and simple texts		X		X
User-centred design			X	
Using sign-language translation	X	X	X	

This study is the first step towards the identification of the characteristics that interactive animations developed for the educational environments of D/HH students should have. The goal of the research is to identify which design criteria graphic symbol based animations should possess in the literacy education of D/HH students. In this framework, the response was sought in this study to the question, "Which design criteria should graphic symbol based interactive animations used in the literacy education of D/HH students possess?"

Methodology

Research Design

The method of the research was shaped in the framework of design-based research (DBR) to optimise the operation in the application of the product to be developed. DBR provides guidance for the development, clean of errors, of a product to emerge by cyclically checking the material development processes (Amiel & Reeves, 2008; Collins, Joseph, & Bielaczyc, 2004; Kuzu, Çankaya, & Mısırlı, 2011). It is reported that the gap caused by the distance from the real-life practices in the field of education is also the reason for the loss of confidence in educational research (The Design-Based Research Collective, 2003). At this point, the goal of the DBR is to manage the interaction between educational research and real-world problems (Amiel & Reeves, 2008).

The study aims to develop the animations to be used in the learning environments of D/HH students under real-world conditions and to develop the most suitable product. In this respect, the first designs for animations with the views of teachers and the evaluations of field experts were developed

as a result of the needs analysis. After the first design of animation was developed, in line with the suggestions of teachers, animations for Turkish Language, Life Sciences, Social Sciences, and Physical Sciences lessons were developed.
In DBR, applicators are seen as a valuable partner in the determination of problems and the production of solutions to these problems (Amiel & Reeves, 2008). In this context, for each application conducted, recommendations for corrections and changes were received by conducting interviews with the application classroom teachers. The researchers conducted in-class observations for the purpose of identifying the problems encountered in the in-class applications of the animations.

ALIS Graphic Symbol Dictionary

The project, briefly called ALİS with the representation of the first letters in Turkish spelling, is an alternative communication system developed for D/HH. TUBITAK was supported with the project number 110K257 to create ALİS dictionary for the hearing impaired individuals. The visual channel is very important for the hearing impaired individuals because of the disruptions in the auditory channel. However, during the use of the visual channel, students' distraction and turning to different points appear as undesired situation. At this point, the ALİS dictionary has been specially developed using graphic symbols purged from details. Graphic symbols, of which standardization studies have been completed, are presented to the use of individuals with hearing disabilities and those concerned. It was initially composed of a total of 843 graphic symbols in 24 categories, and it continues to be developed by the addition of new graphic symbols (www.alis.org.tr).

Figure 2 presents examples of the graphic symbols found in the ALIS dictionary.

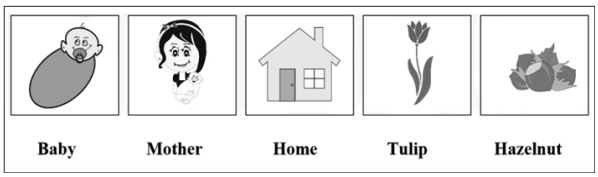

Figure 2. Examples of the graphic symbols found in the ALIS dictionary

Study Group

The participants in this study were chosen through the purposeful sampling (Patton, 2014) method, considering the speculative framework, objective, and research problem of the research. In this context, participants of the research are composed of two classroom teachers who work in a primary school for the hard of hearing and seven students. Teachers who graduated from the Department of Special Education were coded as T1 and T2. T1, the third-grade teacher, has ten years of classroom experience while T2, the fourth grade teacher, has nineteen years of classroom experience at the school for the D/HH.

In addition, seven students in third and fourth grades were included in the study. All students have advanced (70 – 90 dB) or very advanced (91+ dB) hearing loss. Table 2 summarizes the demographic information for the research group.

Table 2. *Demographic Information About the Students*

Student Code	ST–1	ST–2	ST–3	ST–4	ST–5	ST–6	ST–7
Age	10	10	9	11	10	11	11
Gender	F	M	F	M	M	F	F
Hearing Loss	91+ dB*	70 dB	91+ dB*	91+ dB*	72 dB	71 – 90 dB*	71 – 90 dB*

**The medical report provided information as high or very high hearing loss.*

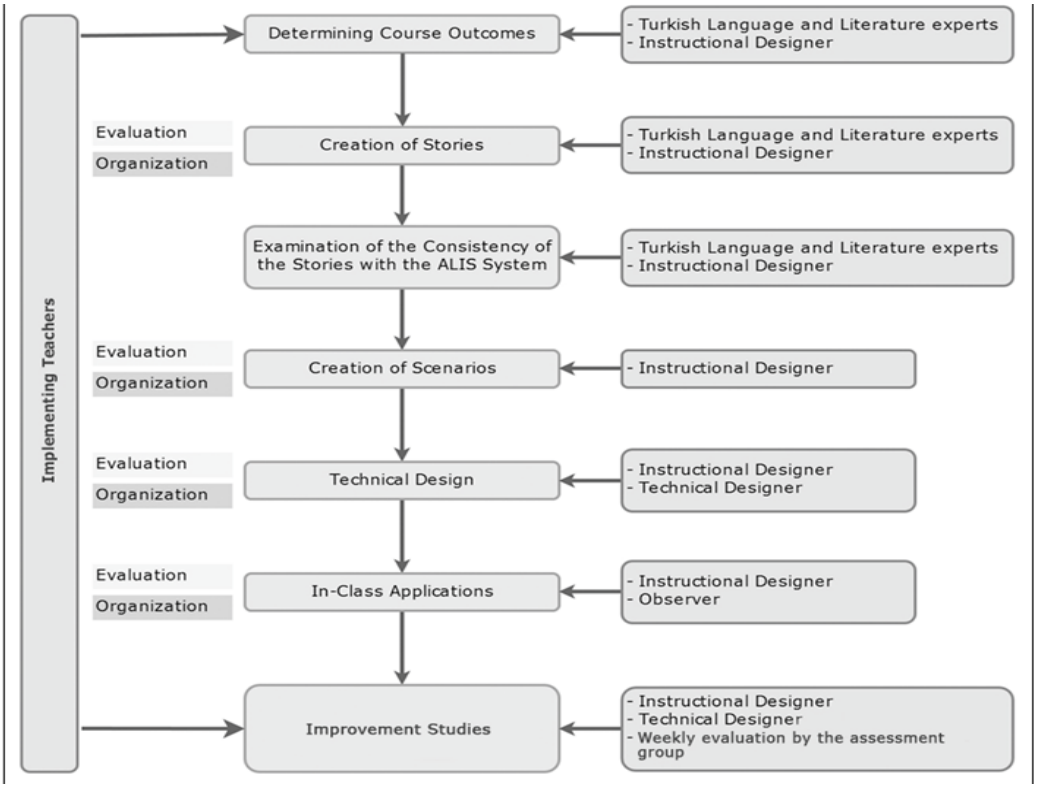

Figure 3. Animation Development Process

Table 3. *Applications where revision requests for the animations emerged*

Application Period	Fall Semester															Spring Semester						
Number of application	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Revision requested applications	R1	R2	R3	R4			R5									R6		R7				

Implementation Process

The research was carried out within the scope of studies supported by The Scientific And Technological Research Council of Turkey (TÜBİTAK) (Grant No. 113K717). In this context, field experts in the project team were tasked with the development and evaluation processes. The animation development process was conducted with the collective work of classroom teachers, an instructional design expert, classroom instruction experts, and Turkish language and literature field experts. Figure 3 summarizes the steps in the animation development process and the field experts involved in this process.

When Figure 3 is examined, this process, which started with the classroom teachers' identification of the course outcomes, was completed with the improvement studies. Application teachers have been involved in the determination of course outcomes, development of story texts for course outcomes, the creation of scenarios and the evaluation in the whole process activities. The experts in the field of Turkish language and literature have developed the stories by considering the ALIS dictionary. Afterwards, the scenarios for the stories were created by the cooperation of classroom teachers and instructional designers. The instructional design field experts turned these scenarios, which were created in the context of stories, into animations at the end of the technical design process. By reorganizing the animations that emerged in the scope of the views and recommendations of the classroom teachers and other field experts, the first applications in the classroom setting were carried out. By evaluating the problems encountered during the in-class applications, the final form was given to the animations after conducting the necessary revision studies. Table 3 presents the applications for which revision requests emerged for the animations used in this process.

When Table 3 is examined, it is seen that a revision request arose after each of the first four applications. The final revision request was received in the 18th application. All animations developed after these were developed with consideration of these requests. The revision process was completed at this point. By re-evaluating the old animations up to the 18th application for which the final revision request was received, the revision suggestions that were left incomplete were completed for these animations.

Data Collection Tools and Data Collection Process

In the implementation, qualitative data collection techniques were used to provide in-depth and detailed data needed by DBR. Qualitative approaches, which are frequently used in the field of special education (Pugach, 2001), are considered valuable in terms of providing researchers in this field with the opportunity to examine the case within the context of the research (Stoner, 2010; Brantlinger, Jimenes, Klingner, Pugach, & Richardson, 2005). In this context, observation and interview techniques were used within the framework of the research. Observations were realized by the researchers following the practices in the class in the role of participant observer (Büyüköztürk, Kılıç-Çakmak, Akgün, Karadeniz, & Demirel, 2014). During the two academic years, observations were made for a total of 43 applications. The researchers recorded each observation in detail as an observation note about the application (design, content, student suitability, etc.) by specifying the date, time, application class and application name. In addition, observations were recorded using photographs, videos or sound recordings (Denzin & Lincoln, 2000). A photo of the observation process of the lesson conducted with the animation of the "Birthday" story applied in the third grade is presented in Figure 4.

Figure 4. A photograph of the observation process of the class conducted with the animation for the "Birthday" story implemented in the third-grade class.

The interviews were conducted before and after each application with two application teachers, in the form of a non-structured interview. In the development studies carried out cyclically within the framework of the DBR, unstructured interviews were conducted to determine the opinions, suggestions and requests of the application teachers. The focus of the questions used in these interviews was to determine the properties that the animations developed should have. Interview questions and rankings are not fixed in unstructured interviews. It can develop during the interview. In this way, it is aimed to collect rich and sufficient information (Büyüköztürk et al., 2014). The data obtained are given as a quotation in the findings section.

Data Analysis

Field experts, technical designers, special education and instructional technology experts should act together in the selection and integration of technologies to be used in the education of disabled people (Véliz et al., 2016; Akay, Uzuner, & Girgin, 2014; Karal & Çiftçi, 2008). In this context, the study conducted with the DBR method, it was important to analyse the data obtained via interviews and observations by technical designers, special education and instructional technology experts during consecutive applications. Using the evaluations after each application made the data analysis process more valuable. To analyse and evaluate the data obtained after each application, an evaluation group consisting of researchers and teachers in the research group of 113K717 was formed. In the evaluation group, there were four instructional designers, two Turkish language and literature specialists, one classroom teacher specialist, and two teachers. Evaluation group members in different areas of expertise provide their opinions, suggestions and contributions about the practices carried out in their own area of expertise. The decisions taken by the evaluation group are discussed, and the final shapes are given to the designs in the animations. Demographic information of the experts in the evaluation group is given in Table 4.

In the practices carried out during the two academic years, weekly or two-weekly meetings were held to exchange views

Table 4. *Demographic Information of the Experts in the Evaluation Group*

Area of Expertise	Institution of Employment	Title
Instructional Design	Karadeniz Technical University (KTU)	Prof. Dr.
Turkish Language and Literature	KTU	Prof. Dr.
Basic/Classroom Education	KTU	Assoc. Prof. Dr.
Instructional Design	KTU	Assist. Prof.
Instructional Design	KTU	Assist. Prof.
Instructional Design	KTU	Res. Asst.
Turkish Language and Literature	KTU	Res. Asst.
Education of the D/HH	Primary School for the Hard of Hearing	Teacher
Education of the D/HH	Primary School for the Hard of Hearing	Teacher

Table 5. *Revision Process Carried Out Based on Chronological Order*

Revision No	Revision Suggestions	Completed Revisions
1.	• There should be an explicit provision in the animation for each sentence in the story. • Objects that are small and eye-straining should be removed.	• The animation was paused for each sentence. Forward and backward buttons were added for navigation after the pause. • Little details in the animation and functionless objects in the background were removed.
2.	• Actions like thinking and speaking should be standardised in the animations. • The writing font should be suitable for the children.	• The demonstration within the animation of actions like "thinking", "speaking", "taking", and "giving" was standardised. • The writing font was organised as a handwriting font.
3.	• Punctuation marks should be provided.	• Punctuation marks such as periods, commas, and question marks were added to the animation.
4.	• The number of words should be decreased for the two sentences, each with seven words, in the story, or the sentences should be divided up. • The flows of events in the stories should not be long because this leads to inattentiveness in the students.	• Long flows of events in the animations were split.
5.	• The animation drawings should suit the current graphics.	• Animation drawings suitable for the visuals found in the ALIS dictionary were made.
6.	• Sound effects and speaking sounds should be used in the animations. • Environmental sounds should be added (e.g., alarm, dog bark, walking). • The scene in the animation where the frog turns into the prince should use magical sound effects to objectify the scene because it is quite abstract.	• Environmental sounds were added to the animations.
7.	• The animations were prepared in the form of three different media and should be combined in a single platform, and the right to choose during the application should reside with the user.	• The demonstration of the text and graphic symbol support in the animations was made optional during the application.

about the applications. The data obtained from interviews and observations in the scope of the research were analysed by the evaluation group. Interview and observation records were presented to the evaluation group as a report after being transcribed by the researchers. After evaluating the criticism from the class teachers through this report by the evaluation group, the revision suggestions were made for the future animations.

Findings

The data acquired throughout the research were presented by following the steps of DBA. Especially the design characteristics of the developed learning environment were determined in light of the data acquired from the analysis step, and design revisions were later shaped with interview and observation data.

Findings Regarding the Stages of Analysis

Regarding the findings obtained, the first drafts of the learning environment to be developed were determined in the analysis stage of the research. Based on the data obtained from the implementing teachers, three different media designs have been proposed for in-class use of graphic symbol based animations for the students. These designs were planned in the form of three different media, namely, animation (A), animation-text (A+T), and animation-text-graphic symbol (A+T+G). Figure 5 shows the placement of animation, text and graphic symbols that will be used in the animations to be developed.

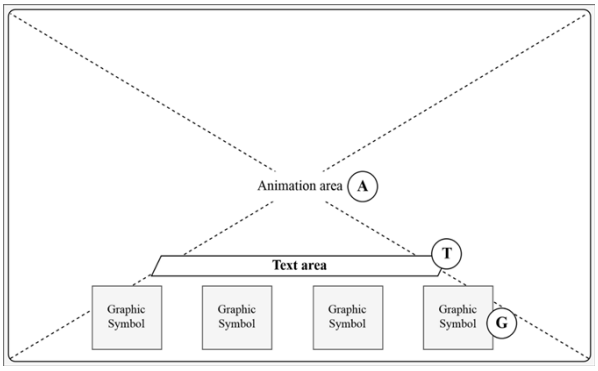

Figure 5. Placements on the screen of the first designs

When Figure 5 is examined, an image of the animation is found throughout the screen. Demonstrations with text and graphic symbols of the stories in the animations are positioned in the lower centre section of the screen. The contents of environments to be developed using this design were reported with consideration of the interviews conduct-

ed with the implementing teachers and the individual characteristics of the students. It was decided that the stories to be used in the contents should be created within the framework of the course outcomes in the individualised academic plans in the Turkish, Life Sciences, Social Sciences, and Physical Sciences courses.

Findings Relating to the Application and Evaluation Stages

The revision studies for the animations developed in the scope of the study were made for fulfilling the needs that emerged with regard to the observations conducted in the in-class applications and the data from the unstructured interviews. The revision suggestions that emerged during the implementation process were put into practice after reviewing by the evaluation group. In this context, the revision process was completed in seven stages. Table 5 chronologically presents the revision process completed in these stages.

The observations of the researchers and the suggestions coming from the class teachers (Revision Suggestions) and the revision studies that the assessment group decided upon for these suggestions (Completed Suggestions) are seen in Table 5. The first round of revisions was conducted as a result of the evaluation of the interviews held with the implementing teachers for the first animations. In this context, it was stated by the teachers that each sentence should have an explicit provision in the animation. In this scope, the views of T2 are as follows:

> *"...case, event and place drawings should be easily perceived by the student." (T2-03.11.2014)*

Another recommendation made after the first application was towards the elimination of small objects that strain the eyes. The interview between T2 and the researchers as follows:

> *"... all D/HH children, the interns are preparing slides, wherever there's something unrelated, the child is inclined towards that. 'Look, a ball.' We can remove these." (T2-03.11.2014)*

The opinions were evaluated at the weekly meeting by the evaluation group. As a result of the assessment meeting, the feature of pausing was added to the animations so that each sentence could be understood in the animation. Forward and backward buttons were added to the right and left sides of the screen for navigation after a pause. It was also decided to remove small objects in the animation environment. In this respect, these suggestions were considered while developing the next animation. In the "Temiz Okul" (Clean School) animation, the sitting children and basketball court in the background shown in circles in Figure 7 were removed due to feedback. Also, the navigation buttons were added to the animations so that the animation could be continued after a pause. These changes to the "Temiz Okul" animation are shown in Figure 6.

Figure 6. Example of the revision that was made in the "Temiz Okul" animation

The second round of revisions was made to standardise verbs such as "thinking" and "speaking" within the framework of the application carried out on 10.11.2014 and to write the fonts in animations according to the style that the students used. This situation is stated in the researcher's observation notes as follows:

> *"The teachers recommended standardising the demonstrations in the animations for actions like 'thinking' and 'speaking'." (Observation Date: 10.11.2014)*

In line with the recommendations obtained, the demonstrations in the animation of frequently used actions such as "thinking" and "speaking" were revised. In this framework, Figure 7 provides the demonstration of the action of "thinking" in the "Temiz Okul" animation before and after the revision. By revising the demonstration of the speaking sounds in the animations, a sound wave synchronised with mouth movements was added as long as the characters spoke. Figure 8 presents a screenshot of an example animation regarding the revision of speaking sounds in the animations.

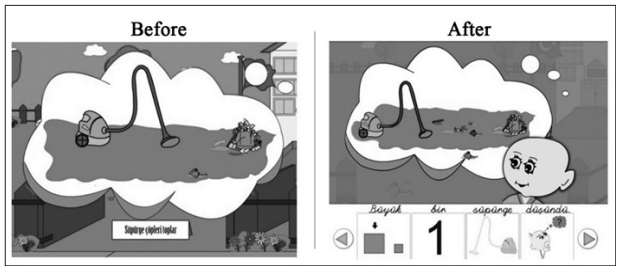

Figure 7. The demonstration before and after the revision in the "Temiz Okul" animation for the act of "thinking"

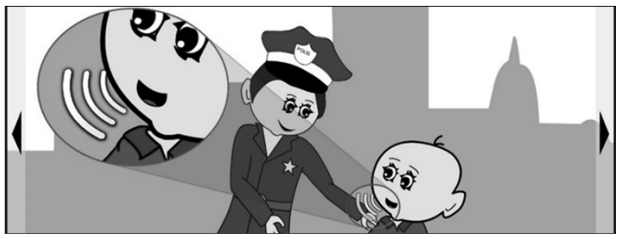

Figure 8. The demonstration in the "Aliş Kayboldu" (Aliş Gets Lost) animation for the act of "speaking"

In the third-round revisions, it was reported that the use of punctuation marks in the sentences that appear in the animations would be beneficial within the framework of the feedback received after the applications conducted on 17.11.2014. The researchers expressed this situation in the observation notes regarding the relevant change suggestions as follows:

> *"T1 reported that punctuation marks should be provided - Punctuation marks suitable for Turkish writing should be used." (Observation date: 17.11.2014)*

These suggestions were reviewed by the evaluation group and punctuation marks such as full stops, commas and question marks were used in the sentences used in the animations. For example, the punctuation marks in the "Toprak, su, hava cansızdır" (Earth, water, and air are inanimate) sentence in the "Cansız Nesneler" (Inanimate Objects) animation are shown in Figure 9.

Figure 9. Sample application for the demonstration of punctuation marks

In the fourth-round revisions, it was reported that long and complicated sentences used in animations in the scope of the practices carried out on 18.11.2014 led to distractedness and that rather than these types of uses, sentences should be used by being divided into two. The change recommendation that T2 specified was noted by the researchers, as seen in Figure 10, following the scenario study of the relevant application ("Cümle ikiye bölünecek. Bu halinin uzun olduğu söylendi". In English, "The sentence will be divided into two. It was said that this version was long").

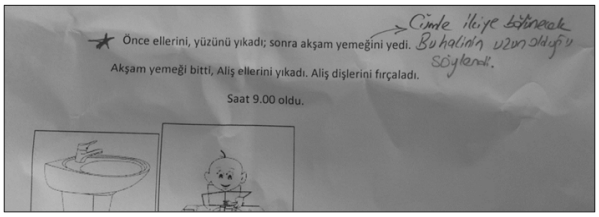

Figure 10. Researchers' notes on the scenario for the animation

The sentence, "Önce ellerini, yüzünü yıkadı; sonra akşam yemeğini yedi" (in English: "First he washed his hands and face, then he ate dinner") recommended to be divided into two by T2 in the "Aliş Evde" (Aliş at Home) animation was rearranged by the evaluation group. In this scope, by dividing the sentence into two parts without creating a change in the flow of the story, it was used in the form of "Önce ellerini, yüzünü yıkadı." (in English: "He first washed his hands and face") and "Sonra akşam yemeği yedi." (in English: "Then he ate dinner"). Figure 11 presents animation screenshots for the conducted changes. Care was shown not to use sentences longer than six words in the stories created after this date.

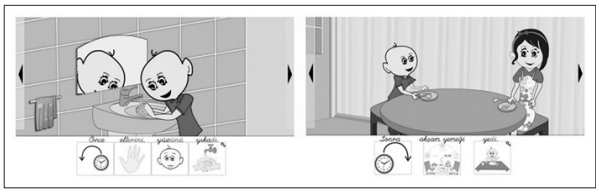

Figure 11. The demonstration of the sentence "Önce ellerini, yüzünü yıkadı; sonra akşam yemeğini yedi." (in English: "First he washed his hands and face, then he ate dinner") in the animation as two separate sentences.

The fifth round of revision was carried out on the basis of the feedback received within the scope of the practices carried out on 17.12.2014. In the observation notes of the researchers it was stated that it would be useful if the drawings in the animations were paired with the graphic symbol glossary:

> *"For some verbs, the students cannot fully understand the drawings made in the animations. The teachers expect the motions in the animation to be like, or at least resemble, the drawings in the graphic symbol dictionary." (Observation date: 17.12.2014)*

Incoming suggestions were examined by the evaluation group and suggestions were given to the designers in order to draw the drawings used in the animations in a way similar to the drawings in the graphic symbols. In accordance with these suggestions, a revision study (Figure 12) was made for the word "düşündü" ("thinking") in the relevant story. When Figure 12 is examined, the provision in the graphic symbol dictionary for the word "düşündü" is seen in the lower section of the screen. The environment in which the character is depicted in the animation is designed in a similar way to the "thinking" graphic symbol. Attention was paid to use of designs similar to the graphics in the graphic symbol dictionary in the animations developed after this date.

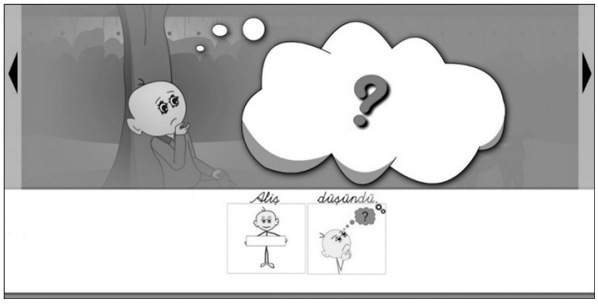

Figure 12. The change in animation for the word "thinking" ("düşündü").

The sixth-round revision studies were conducted in line with the requests of the implementing classroom teachers for the use of sound in the animations in the applications conducted on 24.03.2015. T1's views regarding the use of sound in animations are as follows.

> *"I think it is necessary to add environmental sounds like a dog barking for giving a sense of fear and a shutter sound when taking pictures, because while students are watching animations with sound effects, they are happier and they can better understand the situation." (T1 - 24.03.2015)*

The evaluation group evaluated the feedback from the implementing teachers and environmental sounds were added to the animations. Environmental sounds continued to be added in the subsequent animations. In the interviews held on 07.05.2015, the reason why it was necessary to add sound in the animations was expressed by T1 and T2 as:

> *"I had wanted you to add sounds to use residual listening, and thank you for adding them. Sound effects are required in animation for listening training." (T1 - 07.05.2015)*

> *"From now on, students with cochlear implants will come. With the new generation of cochlear implants, sound effects are important." (T2 - 07.05.2015).*

The seventh-round revision covers the evaluations made by the evaluation group for the applications carried out throughout the period. Throughout the applications, the environments for the animation (A), animation and text (A + T), and animation, text and graphic symbol (A + T + G) were combined in a single environment. In this way, the teacher can grant the students the right of selection during the application of the animations. In this respect, Figure 13 presents the revised form of the spatial design characteristics for the objects to be used in the animations.

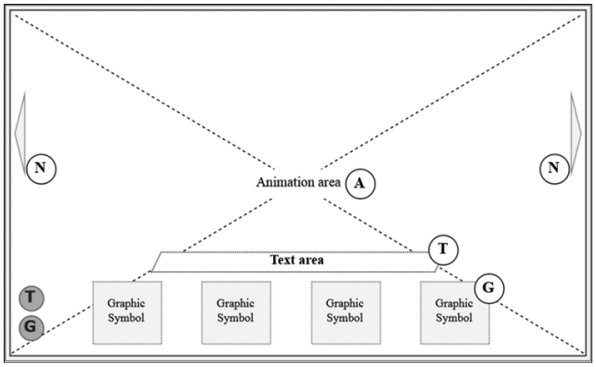

Figure 13. The revised form of the spatial design characteristics for the objects to be used in the animations.

When Figure 13 is examined, it is seen that the initial positions of the animations (A), texts (T), and graphic symbols (G) have not changed. Besides this, however, the navigation (N) button, that allows the pause to be consciously guided

forward or backward after each sentence in the animations, was added to the right (forward) and left (backward) sides of the screen after the revisions. Also, the T (Text) and G (Graphic symbol) buttons on the left side of the screen make it possible to use the A, A + T and A + T + G environments which were used separately in the first applications. Figure 14 presents a screenshot for the "Test" application regarding the final version of the revisions made in the animation.

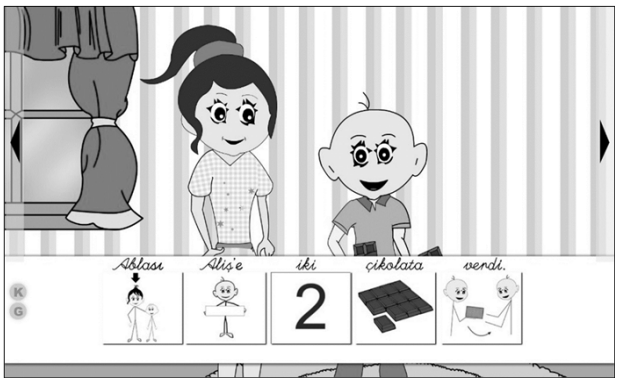

Figure 14. The unification in a single material of the animations developed as three different materials.

The revisions made in light of the data acquired during the application process were implemented retrospectively for all the animations developed. In this way, an open platform (www.alis.org.tr) is provided to all users to access the animations which are provided in a standard view. In this scope, the characteristics that graphic symbol based animations should have and the points that should be taken into consideration in the application can be summarised as in Table 6.

Table 6. *The characteristics that animations based on graphic symbols should possess*

Characteristics	Application Style
Simple designs	Objects that are small, eye-straining or functionless in the background should not be used.
Standard drawings	The drawings of frequently used actions should be standardised.
	Standard designs should be made that express that the character is speaking in the animation.
	The drawings used in the animations should be standardised.
	Animation drawings should be consistent with the graphic symbol system used.
Suitability for the student	The writing font used in the animation should suit the writing style of the student.
Short and simple sentences	Punctuation marks should be provided in the texts used in the animation.
	Sentences should be composed of at most six words.
Avoiding complicated explanations	Long flows of events should be divided.
	Each of the words that make up the sentence should be presented together with the relevant graphic symbol.
	There should be an explicit provision in the animation for each sentence in the story.
Providing sound support	Sound effects and speaking sounds should be used in the animations for residual hearing.
	Environmental sounds should be added (e.g., timer, dog bark, walking).
Opportunity for interactive use	The choice of text and graphic symbol support in the animation should be left to the user during the application.

Discussion and Conclusion

It is known that the educational problems that D/HH students experience lead to their encountering difficulties in establishing a relationship between written materials and visuals (Nikolaraizi et al., 2013). It is stated that the use of enriched educational environments in addition to pictures and texts will be useful for the learning of D/HH students (Debevc et al., 2010; Zainuddin et al., 2010). It is stated that interactive multimedia applications increase the learning potential of students in literacy and vocabulary learning studies (Şılbır, 2011; Doğan & Akdemir, 2015; Yovkova, 2010). At this point, since the attention of D/HH students to their environment is visually based, it is seen as a necessity to investigate the characteristics of the materials to be developed in order for the visuals that will be presented to the students in educational environments to be effective (Doğan & Akdemir, 2015; Ünlüer, 2010). It is emphasised that the materials to be prepared for D/HH students should be visually rich and supported with different resources related to the course outcomes of the students (Reitsma, 2009).

When the animation development studies conducted for the educational environments of D/HH students are examined, it is generally seen that they are studies for the animation of sign language (Kaneko et al., 2010; Kipp, Heloir, & Nguyen, 2011; Kourbetis, 2013; Verlinden, Zwitserlood, & Frowein, 2005). However, there are also studies developed with the name of the learning environment or cartoons which contain animations (Cambra et al., 2014; Debevc et al., 2010; Lányi et al., 2004; Petrie et al., 2005; Verlinden et al., 2005; Zainuddin et al., 2010). In the studies examined, it is seen that features such as using simple designs, supporting with text, presenting short event streams, and using text and image together are discussed in the scope of different studies in the animations developed for the D/HH students. At this point, it is crucial to determine the types of components to be developed for D/HH students and the characteristics of these components. In addition, no graphic symbol based animation system was observed in the examinations made. Based on the findings obtained in the current research into a graphic symbol supported animation system developed for use in the literacy education of D/HH students, it was determined that text, graphic symbols, animation, buttons that make text or graphic symbols visible or hidden, sound, and forward-backward navigation buttons should be included.

It was reported, in the environment that Zainuddin et al. (2010) developed with the support of elements with increased authenticity with reference to the need of D/HH students to learn visually, that graphics needed to be colourful and composed of simple drawings, that the texts needed to be supposed with brief and suitable graphics, and that texts, pictures, sign language, and 3D models could be used together. The current study reveals similar research results. The conclusion was reached that simple designs needed to be made by avoiding small-scale drawings with no connection to the subject flow or story contents found in the background in the animation designs. It is seen that the characteristics specified in the scope of the research were handled separately in different studies. Lányi et al. (2004) report that the use of simple rather than professional designs is more convenient for D/HH students. The elements that distracted the students were removed from the environment in this respect. Also, at the point of presenting the texts with short and suitable graphics, all the sentences found in the conducted study are composed of at most six words, and the provision of a graphic symbol is presented together with a word. It is known that it provides better results to use words together with visuals compared with only the use of words (Gentry et al., 2004). Animations, graphic symbols, texts, and sound effects were used together in the study. It is found in different studies that the use of dif-

ferent combinations of text, images, sign language, sound, and 3-dimensional models in the same setting is effective for D/HH students (Debevc et al., 2010; Petrie et al., 2005; Zainuddin et al., 2010). However, different from the examined studies, the graphic symbols and subtitles in this study were independently addable to, or removable from, the environment. In this respect, environments can be created that allow students to occasionally conduct activities in the in-class applications such as matching and writing with uses such as animation only, animation+graphic symbol, or animation+text.

Many previous studies state that the support of subtitles provides a supportive characteristic in the definition of words that cannot be perceived through auditory methods for D/HH students whose native language is not the language presented in the materials (Cambra et al., 2014; Debevc et al., 2010; Petrie et al., 2005). Subtitles were added to the environment as a supportive element in the study. However, it was reported that subtitles needed to vary with the current writing styles of the D/HH students.

Another notable point made by the researchers was that it was necessary for each sentence to be found explicitly in the animations that would be presented to D/HH students so that the D/HH students could extract meaning from the relevant sentence. At this point, the flow of events in animations or cartoons prepared for D/HH students can lead to a loss of the goals to which educational importance needs to be attached. For example, if three different situations are desired to be given within an animation, there is the possibility that the student will notice only one and not notice the other two situations at the end of this animation. For this reason, the presentation by pausing the animations prepared allows the student to evaluate each pause as a new situation. The forward and backward buttons fixed on the right and left sides of the screen are navigated after stops. When examined from a schematic perspective, it is recommended that the placement of the navigation buttons should be fixed (Debevc et al., 2010). Since it provides ease of use in the literature, it is possible to say that the navigation buttons that are valued, contribute to the meaning of a story presented with animation.

As a result, the animations based on graphic symbols planned to be used in the literacy education of D/HH students should have simple designs that are cleansed of long sentences and that do not contain confusing drawings. The presentation with the same standard of the verbs used frequently in the animations helps the story to flow steadily. Another situation is that in the teaching of abstract or long words, these concepts should be emphasised numerous times in the animations. A previously conducted study emphasised that the number of new words in the text of a story that D/HH students newly encounter should be limited to 3-4 words (Lányi et al., 2004). It is clear that helping D/HH students who are unable to efficiently use auditory channels because of hearing loss to effectively use visual channels will contribute to the education of these students. By conducting constant revision operations in the scope of the applications, an attempt was made to obtain designs that best suit the D/HH. Considering the characteristics possessed by the materials that emerged as a result of these studies, it is seen that animations, graphics, symbols, and words can be presented at the same time to D/HH students.

Recommendations

It is essential to work together with the teachers to consider the individual characteristics of D/HH students in the process of developing materials to be used in the educational environments for these students. In the development of these types of materials, it is seen as important for there to be an educational technologist who will work together with the teachers in terms of the applicability of the design criteria.

It is reported in studies conducted with hearing individuals in the literature that information presented to students via both visual and auditory channels is more beneficial than information presented by means of only auditory or only visual channels (Moreno & Mayer, 1999). It was inevitable that these studies conducted with hearing individuals would produce different results to those for D/HH students. For this reason, research can be conducted with different studies towards the identification of visual channel capacities for the use of visual channels by D/HH students.

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Astronomy Education for Preschool Children: Exploring the Sky

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Abstract

The purpose of this study was to examine the effectiveness of astronomy activities in science education with preschool children through semi-structured interviews. The interviews were conducted with the children before and after the implementation of the activities. Five activities about astronomy were conducted for five weeks in practice. A total of 15 preschool children (seven boys and eight girls) in the age range from 60 to 72 months participated in the study. Semi-structured interviews were individually conducted, digitally recorded, transcribed, and analyzed by the researchers of the study. The related data were collected by semi-structured interviews prepared by the researchers of the study. It was revealed that the preschool children were curious about the "Discovery of the Sky" subject. They were interested and enthusiastic to learn the subject matter, and they were positively affected by the practices. It has been concluded that new concepts related to the subject of "Discovery of the Sky" have developed by using different methods and techniques.

Keywords: Basic Astronomy Concepts, Astronomy Education, Preschool Education

Introduction

Percy (1998) claimed that there are many reasons for astronomy to be a part of the education system and culture. Astronomy is deeply rooted in the history of almost every society as a result of its practical applications and philosophical effects. Astronomy still has daily practices for long-term problems, such as timekeeping, seasons, maritime, and climate, as well as climate change and biological evolution. It not only contributes to the development of physics and other sciences but also an important and exciting science in itself. It is about the stars, the planets, and life itself. It shows our place in time and space, as well as our kinship with other people and species on the Earth. It reveals a wide, diverse, and beautiful universe. It fosters curiosity, imagination, and a sense of shared discovery. It also provides a pleasant hobby for astronomers, casual sky watchers, or millions of people. In the school context, it shows an alternative approach to the "scientific method". It can attract young people and increase public attention to study science and engineering and increase the understanding of science and technology that is important in all developed and developing countries.

Astronomy has been one of the oldest sciences for centuries and considered an interdisciplinary science examining the structure and motion of planets and is associated with a variety of developing sciences (Düşkün, 2011). As the study of Erentay and Erdoğan (2009) revealed that children are interested in scientific concepts from an early age. They first begin to see and recognize these concepts in their environment. For a child in the preschool period, what they think and observe is important for concept development. Early childhood is a period in which children gain basic concepts and scientific process skills through their experiences. Children who are curious about the developmental period often ask questions and do research to explore the environment they live in. Children learn faster in environments where they can observe and arouse their curiosity (Erentay & Erdoğan, 2009). The action plans prepared to help students learn basic astronomy concepts were found useful and increased students' curiosity and learning about the subject (Yılmaz, 2014).

Astronomy subjects have been one of the popular topics in the school curriculum for decades (Lelliott & Rollnick, 2010). It is seen that they have been used effectively to endear the course to the students and direct them towards science (Tunca, 2002). Interpretation of knowledge and gaining scientific process skills in the preschool period are provided by science education (Hamurcu, 2003). This period is of great importance in terms of the understanding of abstract concepts and facilitating the learning of science subjects (Uyanık-Balat & Önkol, 2013). Some of the subjects included in preschool science education are our bodies, our health, food, animals, plants, (non)living beings, the Earth, and space (Alabay, 2013). Sun, planets, and stars subjects are impressive for children. Children in this period are curious and very observant of the characteristics, movements, and physical appearance of the planets. Young children are interested in day and night events and the sky. This interest leads children to make observations of celestial bodies and events in their daily lives (Kallery, 2011). Children's desire to explore is the basis for scientific sensitivity. Many concepts, including mathematics and scientific terms, begin to be acquired in the preschool period.

Children who make observations to understand the world ask questions and do research to find answers to the questions. They want to access a lot of information about the Earth, environment, space, plants, animals, soil, and water from the moment they are born. In this period, families and educators, guiding the children in curiosity, have great responsibilities. Parents provide the first scientific experience of children. Adults can support children's scientific process skills by helping them understand the world. Therefore, especially considering that for children, the years from three to six are a curiosity period, descriptive answers should be given, and their entrepreneurship and curiosity feelings should

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be supported by adults' being more sensitive to the questions that children ask during this period (Ceylan, Gözün-Kahraman, & Ülker, 2015). The studies depicted that astronomy activities develop students' curiosity and exploratory feelings and direct them more towards science (Tunca, 2002). Some claimed that the world and planets are the subjects that children want to learn and wonder most about (Laçin & Şimşek, 2007). Additionally, The European Astronomical Union defended that astronomy education should begin at an early age and that astronomy-related terms should be taught to children (Taşcan & Ünal, 2015).

Concepts of children's structure of the Earth have long been the focus of attention. Young children can record weather events, measure the rain, follow the direction of the wind, and notice the effects of it. They can simply explore the surface of the world using sand and water games (Balat, 2011). Most studies indicated that children focus on understanding the shape of the Earth, the day and night cycle, seasons and moon concepts (Saçkes, 2016). Saçkes and Korkmaz (2015) examined preschool children's conceptual understandings of the shape of the Earth and the characteristics of the cognitive representations they constructed. Their findings indicated that almost all of the children answered the question about the shape of the world as a round form or circle. When the children were asked to make the shape of the world from play dough, they generally formed globular, oval, or circle Earth models. When they were asked to draw the shape of the world, half of them produced circular drawings that included people; and some of them made drawings representing the sphere. Nearly half of the children answered the question of what was on the Earth, and the answer was space, planets, and other celestial bodies. Some of them answered clouds and airplanes, and the rest of the children answered houses and people. Kampeza (2006) indicated that although children are aware of the Earth's shape and that of the planets, the relationship between shape, rotation, and the day/night cycle is unclear. There are studies showing that preschool children have alternative concepts for the phenomena they observe, such as day and night cycles. Therefore, learning the basic concepts of astronomy at school can help children understand certain phenomena that constitute an important part of their daily lives. It can also contribute to the development of scientific thinking (Kampeza & Ravanis, 2006). Lelliott and Rollnick (2010) stated that while the conceptions about the Earth and the day-night cycle are relatively well comprehended by older students, the phases of the Moon, the seasons, and gravity are the concepts that most people find difficult to understand and explain.

Trumper (2006) stated that learning astronomy requires abstraction skills and a comprehensive understanding of the concepts of space and time, or, alternatively, it requires teaching pathways that explain phenomena as concrete as possible. According to Özsoy (2012), children have difficulty understanding the shape of the earth and various misconceptions regarding its shape. She also declared that cartoons, storybooks, and daily life experiences were the reasons for children's misconceptions. Kurnaz (2012) focused on students' understanding of the concepts of sun, Earth, moon, star, planet, and natural satellite and showed that primary and secondary school students have difficulty in understanding and visualizing these concepts. Not only primary and secondary school students but also preservice science teachers have alternative ideas about some astronomy concepts, such as stars, polar star, planets, moon, Earth, sun, and black hole (Bozdemir, Çevik, Helvacı, & Kurnaz, 2018). Kurnaz and Değermenci (2011) indicated that regardless of their grade level, students could not match the concepts of astronomy and their characteristics correctly and that the answers given for astronomy concepts and examples were inconsistent. They also concluded that students have similar misconceptions at all grade levels and that they construct different perceptions for their examples with the given concepts. The researchers also stated that there might be an inadequate learning environment at the root of the problem.

In Washington state, early learning and development guidelines (2012), the importance of science in the preschool curriculum was emphasized for better preparation of students with the skills they need for future learning. According to this guideline, preschool children may make observations and ask questions, observe patterns in nature, such as shapes of clouds, phases of the moon, be more observant of the environment including observing shadows and changes in the position of the sun, start to understand systems (e.g., solar system, digestive system), identify individual parts and how they work together. Similar to the US system, the Turkish preschool curriculum has the following statements included in the 60–72 months of cognitive development of children: Preschool children remember the details of a picture shown for a short time, say the similarities and differences between objects, and are able to say the position of objects containing an array. Consequently, the introduction of science into preschool curriculum is emphasized in preschool education. Developmental early childhood teaching practices are based on three principles, which are multi-age grouping, nongraded curricular materials, and interactive teaching (Elkind, 1989). Multi-age grouping increases diversity among young children. Ungraded curriculum materials can be used for the benefit of children with different developmental levels. Effective interactive teaching means that the teacher must have a solid understanding of both the intellectual demands of the materials and their cognitive abilities. In interactive education, a teacher is expected to act as a matchmaker between the student and the materials. Therefore, the current study is suitable for the child development age of 60–72 months owing to the content of the activities, applicability to different age groups not limited by the curricula and including interactive activities.

In science education applications, activities that support the creativity of children by taking into consideration the developmental characteristics and that develop the scientific process skills should be included. In the current study, the subject of space in the preschool period was chosen since it is a subject in the scope of science and nature activities. It is important that the sun, the world, the planets, and the sky, in general, are among the subjects that interest children. In the light of the literature findings, the concepts of astronomy that children frequently encounter and ponder in their daily lives are discussed in this study. This study aimed to engage preschool children with astronomy-related activities and determine, through semi-structured interviews, the effectiveness of these activities.

Methodology

The study used phenomenology, one of the qualitative research methods. In phenomenological studies, researchers attempt to form the essence of the participants' experiences (Creswell, 2013). Semi-structured interviews were conducted with preschool students to learn their thoughts and experiences. According to Gay and Airasian (2000), interviews allow researchers to obtain important data that cannot be obtained from observation. Interviews can explore and probe participants' responses to gather more in-depth data about their experiences and feelings. They can examine attitudes, interests, feelings, concerns, and values more easily than by using observations.

Study Group

This study was conducted in a private school in city center. This study group was selected by the convenience sampling method. The students were planned to participate in space activities during the space week between October 4 and 10, before this study. A total of 15 preschool children participated

Table 1. *Solar System Activity Plan*

Name of the Activity		Solar System
Name of the Activity		Solar System
Activity Type		Science-Art-Group Activity
Teaching Methods		Question-Answer, Demonstration
Teaching Techniques		Brainstorming
Materials		Planet video, eight balloons covered with waste newspapers, handmade papers, various decorative materials, glue, colored finger paints
Age Group		60–72 months old
Gains	Development Areas	
	Cognitive Development	Students should be able to: - say the name of the planets. - tell the planet where they live. - sort the first four planets according to their distance to the sun. - tell the sizes of the planets. - compare planets according to their sizes. - understand what the solar system is.
	Linguistic Development	Students should be able to: - tell about the planets. - ask questions about planets.
	Motor Development	Students should be able to - paint newspaper-covered balloons according to instructions. - arrange them side by side according to their sizes.
	Social-Emotional Development	Students should be able to work as a team by sharing materials.

in the study (age range 60 to 72 months), including seven boys and eight girls attending a private preschool in 2018–2019 academic years. This group of students was private school students, that is, they came from families with a high socio-economic background. All students participating in the study received kindergarten education when they were between three and five years old. During this course, the children raised many questions about space and planets.

Data Collection Method

Semi-structured interviews were conducted with the preschool children before and after the implementation of the space-related activities. Students were asked questions, such as "What do you know about space?", "What are the words/terms you know about space?", "Have you watched a movie or documentary about space?", and "In your family, are there any books about this subject that deal with space?". The results of the interviews are the answers that arose during the conversation about the astronomy-related activities. The reason why this study used the interview method is that the average age of the children is very low, and this method is suitable to provide deep information about students' way of thinking.

Preparation of Activities

In this study, planned activities and materials to be used for astronomy in science education for preschool the children were prepared considering the gains in Table 1. In the preparation of the activities, the following explanation regarding the science made by the Ministry of National Education (2013) was taken into consideration: "Science activities should have the characteristics of directing children to question, draw attention to, observe, examine, and explore the concepts of science". The names of the activities were "Solar System", "Rocket Making", "Space 4D Virtual Reality", "My Dream Planet", and "Moon Walking". "Moon walking" is an activity that children joined into with their families. The first week of activity is given in Table 1. The children were interviewed before deciding on the scope of the content. In the preliminary interview with them, the activities were planned, considering their answers. The reason why rocket production and moon walk activity was especially chosen was that these age-group children mentioned that they wanted to be astronauts, and they were very curious about their astronaut lives. In the preparation of the Space 4D event, the technological curiosity of today's children was considered.

Data Analysis

Semi-structured interviews were conducted with a total of fifteen students. Each interview was conducted individually and lasted about 20 minutes. All interviews were audio-taped and transcribed later. In the analysis of the data, a descriptive analysis was implemented. Researchers first analyzed and coded the astronomy data. These codes were collected under appropriate themes after coding. Descriptive statistics provided frequency tables and the distribution of the variables. For reliability analysis, 20% of the data were analyzed by independent researchers (science education specialists). Thereafter, the reliability value was calculated as .89 according to Miles and Huberman (1994) consensus disagreement formula.

Results

In this study, 60–72-month-old children were asked some questions, such as "What do you know about space?", "What are the words/terms you know about space?", "Have you watched a movie or documentary about space?", and "In your family, are there any books about this issue that deal with space?" during interviews. The children's responses to these questions are summarized in Table 2.

Table 2 shows a remarkable difference between the answers of the children participating in the activities in the preliminary interviews and their answers in the final interviews. In the preliminary interviews, the children generally talked about the concepts of planet, space, astronaut, the Sun, Earth, Moon, and stars. After the astronomy practices, it was found that the children mentioned the concept of the Solar System and expressed the number of planets correctly. While the children used only the term of astronaut before the application, they used expressions about astronaut costume and an astronaut's life after learning about the implications. One of the noteworthy elements of Table 2 is that although the students mentioned the Sun as a planet before the application, they mentioned the Sun as a star after the

Table 2. *Pre- and Post-Interview Answers of Preschool Children*

Number of Answers	Pre-Interview	Post-Interview
1	Astronauts sewed the flag. There are meteor showers.	I learned about astronauts. I've learned that there are many spacecraft. I learned that there are big and small planets. There are eight planets in space.
2	There are stars in space. There is Earth.	I found out there are other planets outside the world. Uranus, Neptune, and Mars. If we're going into space, we need to wear space costumes. Saturn, the planet that did not fall when we threw it into the sea. The sun is a star.
3	There are stars in space. There are moon and astronauts.	Those without special clothes can't stay there. He can't live on the sun because it's hot.
4	In space, there are Jupiter and Earth.	There is no gravity in space. Anything can jump. They wear masks to breathe. On their way, they see Neptune, the Sun, and the Moon.
5	The meteors fall from space. There are stars. Planets, the Sun and the Earth exist.	Rocket, planet, stars. Pluto is a dwarf planet.
6	The meteor falls from space. There are stars. Planets, sun, and Earth exist.	I learned about stars, Uranus, the moon and astronauts. I learned about the space rocket and the aliens. I've learned all the planets in space. Jupiter is the largest planet.
7	Stars are in space. Uranus, astronauts and Neptune.	I learned the planets. Pluto is a dwarf planet. There are eight planets. The ringed planet is called Saturn. Jupiter is the largest planet. Astronauts can go into space and collect moon fragments, and then examine them.
8	There is a space rocket in space. There are round stars and the moon.	We've learned that meteors are different and there is no life in space... We've learned what the planets are. There are eight planets, such as Jupiter, Earth, Uranus, and Neptune. Walking on the Moon is difficult because there is no gravity on it.
9	We live on Earth. We can go into space. We can go to Neptune and the moon.	I learned that Uranus and Neptune looked blue in the distance. The earth is third and is our planet. Everywhere on the earth is full of living things. Jupiter is the largest planet. The sun is a very hot star. I love the planets.
10	We live on Earth. We could go anywhere. We can even go to space.	I learned that some of the planets are ringed and blue. There is only life on earth among planets. For example, the earth revolves around the sun and itself. The moon is our satellite; in fact, it does not shine but reflects the light of the sun to us.
11	We go to Jupiter in space. We live on Earth. There are large telescopes in space.	Moon, I've known it for a long time. There are winds inside Jupiter. I have learned about the dwarf planet, Pluto.
12	Meteors fall. There are astronauts in space. There is Earth.	The sun is very hot and there is no air in space. That's why astronauts have an air tube. Astronauts drink their drinks with a straw.
13	Counting the Sun, there are 10 planets. Astronauts cannot stay in space for a day or two.	There used to be nine planets in space. Now, there are eight planets because Pluto is so small that scientists have removed it from being a planet. The sun is not a planet, it is a star.
14	In space, there are stars, meteorites, and Earth.	The planet Mars is also known as the red planet. We're in the Solar System. There are Neptune, Mars, Mercury, and Jupiter. When the sun is seen from a distance, it looks larger than other stars, but in fact, they are of the same size.
15	There are planets and astronauts in space. There are aerolites in space.	There are eight planets. I learned that Mercury is the closest planet to the sun, and Venus is the brightest planet because we have the planet Saturn ring that does not fall when we throw it into the sea. The sun, which is our star, warms us. The earth, which we live on, is in third place.

Table 3. *Frequency Distribution of Astronomy Terms during Pre- and Post-Interviews*

Astronomy Terms	Pre-Interview		Post-Interview	
	f	%	*f*	%
Sun	15	100	15	100
Star	14	93	15	100
Meteorite	10	66	4	26
Earth	8	53	15	100
Mars	5	33	15	100
Jupiter	1	6	15	100
Mercury	-	-	15	100
Venus	-	-	15	100
Saturn	-	-	15	100
Neptune	-	-	15	100
Uranus	-	-	15	100

practicing activities. After activity implications, they said that the planet that we live on is ranked third in proximity to the Sun, and they used the cyclic planet term for Saturn. They talked about the physical properties of the planets; for example, they stated that "Mars is the red planet", "Jupiter is the largest planet", and "Pluto is a dwarf planet". They also stated that the "Moon is a satellite of the Earth", and space is an environment of gravity. They paid attention to the position of the planets in the solar system relative to the Sun, and stated that Mercury is the planet closest to the Sun.

Table 3 presents the frequency and percentage of the terms used by the students during the preliminary and final interviews.
Table 3 shows that while the children could express the names of three of the planets before the practices, all the children could express the names of all the planets after the practices and paid attention to their sizes. Additionally, it was found that the majority of the children knew the order of the planets with respect to the proximity of the latter to the sun; this ability was among the top four. Furthermore, in both interviews, the children were posed the following questions: "Do you want to go into space?" and "Are you curious about space?", and everyone answered them in the affirmative. In the last interview, ten children stated, after the activities, that they were more curious about space and wanted to go to space.

Discussion and Conclusion

The results of the study indicated that although the children generally talked about the concepts of planet, space, astronaut, the Sun, the Earth, the Moon and stars in preliminary interviews, they mentioned the concept of the Solar System and expressed the number of planets after astronomy practices. Also, they used the term of astronaut before the application, but after the practice, they gave details about astronaut life. The idea that "the Sun is a planet" has been replaced by "the Sun is a star". In the post interviews, it was determined that preschool students used the term meteor less than before their engaging activities. This may be because astronomy activities are not directly related to the concept of a meteor, and hence the decrease in the frequency of its use. Furthermore, the children were able to sort the planets according to their distance from the Sun and give their properties by analogies. For instance, they would state Mars as a red planet, Jupiter as the largest planet, and Pluto as a dwarf planet. Likewise, Küçük and Şimşek (2017) specified that children are very curious about space and define it as a big void. The children stated that there were the Sun, the Moon, the Earth, stars, and planets in space. There were also some children who learned the names of the planets and some characteristic properties of them. For instance, some of the preschool children learned that the Earth is round, the Sun is a star, the name of almost all the planets, the temperature of the planets according to their proximity of the latter to the Sun, that there is a storm on some planets, Pluto is a dwarf planet, astronauts go to space, astronauts go to space with a space rocket.

The present study reveals that preschool t children aged 60–72 months participated in the activities with interest and enthusiasm. When the developmental characteristics of the children in cognitive, linguistic, motor, and socio-emotional domains were examined, the activities they practiced helped them to use their scientific process skills. The preliminary and final interviews results reveal that

children learned many of the concepts of astronomy better through the activities implemented. It has been observed that these activities positively affected their motivation and attitude towards astronomy, and thus there was an increase in student participation in each activity. Besides, it has been observed that the children could learn many concepts easily through practices and were willing to work after designing concepts in this design. Studies indicated that since preschool students do not take courses in astronomy at school, their ideas are based on their own environmental perceptions (Hannust & Kikas, 2007). Moreover, preschool students have some misconceptions about day-night, seasons, and moon concepts. During the interviews, preschool students stated that they learned these concepts from their families, daily experiences, and observations (Küçüközer & Bostan, 2010a).

Ampartzaki and Kalogiannakis (2016) mentioned that learning should encourage young minds, engage, and excite them so that they will accept the new information presented and develop a lifelong interest in astronomy. The relation between the real world and symbolic representation is critical to understanding astronomical phenomena. Dunlop (1998) also explored the ideas that children who visited Auckland Observatory and the Stardome Planetarium had about the Earth, the Moon, and the Sun. Several ideas, unlike other studies, were reported. For instance, two children drew eight orbits traveling around the Moon in a day and the Sun at night for the Earth. Only one child out of 67 who participated in the study proposed the concept of day and night caused by the Sun.

Campos, Pessanha, and Jorge (2011) stated that the augmented reality practices applied in the preschool period increased curiosity in children and supported cooperative learning. It was also determined that children who could not see the planets exactly with the naked eye but may have heard of them were able to express better the sizes of the planets after the practices. The children stated that the concepts in astronomy were represented in three dimensions in the best way with augmented reality applications and they were very realistic. It is thought that a three-dimensional image contributes to the retention of knowledge of a child in the preschool period. Likewise, Hsieh and Lee (2008) stated that the Augmented Reality English Learning System (ARELS) designed for preschool children in a preschool consists of fun and effective participation of children. Thanks to the combination of virtual objects and reality scenes, children can use ARELS to learn English words by playing. Each augmented reality (AR) English word card corresponds to each 3D virtual object, respectively. They used the alphabet 'E' Earth word as an example. Children could turn and move the AR English word card around in any direction arbitrarily. In this way, they could learn an English word by seeing its 3D image.

When the preschool education program of the Turkish Ministry of National Education in 2013 was examined, the 5th educational gain involved children observing objects or assets. It was found that those children achieved this cognitive gain by realizing the sizes of the planets in the design of the planetary activity. In the 9th gain, it was stated that children could "sort objects or assets according to their characteristics". When the responses of the children were examined, their rankings were observed by comparing the planets according to their sizes. In relation to the cognitive development of children, it was stated that children could "establish a cause-and-effect relationship". The child was expected to ask open-ended questions to express their thoughts about the outcome of any event or situation, to find possible causes of the situation. They stated that the Moon was the satellite of the Earth. In the present study, all activities carried out within this scope were carried out considering these gains.

Küçüközer and Bostan (2010b) determined that preschool students have various ideas about the center of the universe, the position of the stars during the day and the brightest star at night. According to interview results, they believed that the Moon was the brightest star at night and that the Sun was in the center of the universe. Since these children had not received any prior instruction on astronomical subjects, their ideas were shaped by their observations and daily life experiences. Students generally do not have a clear idea of the Sun/Earth/Moon model and lack some concepts to build it. They also find it difficult to express themselves in diagrams. Very strong incentives are needed to draw attention to the written text as well as special instructions from the teacher if learning is to take place (Pena & Gil-Quilez, 2001). Studies also demonstrated that not only preschool students, but also preschool teachers have alternative ideas, including definition, motion, brightness, structure, and shape for the concepts of stars, planets, the Earth, the Sun, and the Moon (Saka, 2018). In this context, the results of the study can be useful in revealing preschool students' ideas about the basic concepts of astronomy.

Recommendations

Interviews with working groups from different cultures can be repeated to improve the reliability of the study. Different methods, such as observation and drawings, can be used to collect the data. Also, parents can be included in the study to find out how they can direct their children's interest in science.

Disclosure Statement

No potential conflict of interest was reported by the authors.

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The Effects of Nursery Rhymes on Improving Reading Fluency of Fourth-Grade Primary School Students*

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Abstract

This study aimed to determine the effects of nursery rhymes, entertaining and prominent products of Turkish folk literature, on improving reading fluency of fourth-grade primary school students. The sample consisted of 44 fourth graders, attending a public primary school in Vakfikebir County of Trabzon province (Turkey) in the 2015-2016 academic year. The sample was grouped into two, namely an experiment and a control group and the students were randomly assigned to the groups. The texts selected for the purpose of the study, were firstly read by the students and they were voice-recorded as they read out before the study was carried out. Their reading rates were measured relying on the recordings by counting the number of words they read per minute, while their reading levels were determined with Error Analysis Inventory and the prosodic features were measured using the Prosodic Reading Scale. Then, the activities involving nursery rhymes were administered to the experimental group for 15 weeks, who were offered two activities per week, while the students in the control group continued their regular education. After the administrations, the measurements were repeated asking the students to read the same texts. The reading rate scores, the accurate reading scores and the data obtained from the Prosodic Reading Scale were analyzed with SPSS, a statistical software program by performing paired samples t-test and independent groups *t*-test. The results showed that the reading rates and the accurate reading skills of the students in the experimental group improved. The implications of the findings are discussed and suggestions are made at the end.

Keywords: Nursery Rhymes, Reading Fluency, Reading Accuracy, Reading Rate, Prosody

Introduction

Reading skill occupies an essential place in people's lives as education necessitates the development of this skill as well as using it as a life-long learning instrument. It is a complicated mental process that requires various other skills and procedures (Güneş, 2007). This process must be managed well for successful reading. Reading fluency is extremely important in this process. In the National Reading Panel (NRP, 2000), reading fluency was regarded as the fundamental component of being a successful reader. Similarly, a great many researchers consider reading fluency one of the crucial elements of successful reading (Baştuğ & Akyol, 2012; Denton et al., 2011; Kim, Wagner, & Foster, 2011; Kuhn, Schwanenflugel, & Meisinger, 2010; Yıldız et al., 2014)

The Turkish education system has maintained a considerable interest in the field of reading fluency over the last years. In the Turkish curriculum, renewed in 2005, the importance of the acquisition of reading fluency was emphasized (MoNE [Ministry of National Education], 2005). By doing so it was intended to support students in vocalizing letters, syllables, and words effortlessly, reading fluently and accurately, and understanding what they read (MoNE, 2019). In order to achieve these outcomes, fluent reading skills must be acquired.

Reading fluency is achieved by focusing on punctuation marks, emphasis, intonation, and semantic units and by avoiding word repetitions and unnecessary pauses (Akyol, 2018). In brief, reading fluency is defined as reading a text accurately and at an optimum speed by automatically recognizing the words (Nunez, 2009). It depends on three different reading skills that affect each other (Baştuğ & Akyol, 2012). These are accurate reading, reading rate, and prosodic reading.

Accurate reading is the first step required by reading fluency. It is also called word recognition. Word recognition refers to the process of deciphering words' sounds and meaning (Koda, 2005). It is difficult, if not impossible, for reading comprehension to improve without the development of word recognition skill. Likewise, Baştuğ and Akyol (2012) point out that for optimal reading comprehension, learners should be motivated to improve their word recognition skill since it is deemed to be the precondition and essential factor for fluent reading. Individuals who cannot acquire these skills will experience difficulties concerning reading rates and prosodic reading in the following steps of education.

The second step of reading fluency is reading rate, which is defined as the duration from seeing and recognizing a word to reading it audibly or inaudibly (Baştuğ & Akyol, 2012). In other words, it means reading a text at an optimum rate. It also refers to automaticity in reading. Automatized reading means reading words quickly and smoothly with minimum effort and by paying the least amount of attention. By doing so, words can be recognized quickly and accurately and the text can be comprehended quickly. Reading should become automatic for a better reading comprehension. Because when a text is read intermittently, semantic units cannot be formed and semantic relationships in a sentence and between sentences cannot be comprehended. Automatism is a required component for prosody (Başaran, 2013, p. 279).

The last dimension of reading fluency is prosodic reading, which is defined as reading a text naturally and concordantly. The prosodic reading skill requires intonation, emphasizing, and lowering and raising one's voice according to meaning and paying attention to punctuation marks, semantic units, and syntax (Keskin, 2012). Prosody is referred to as intonation and rhythm in colloquial language and in this aspect, prosody is also known as the music of language (Kuhn et al.,

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2010). It is important to perceive this music in prosodic reading. "It can be stated that the closer prosodic skill of reading gets to prosodic skill in colloquial language, the better reading and thus comprehending would be." (Keskin, 2012, p. 33). It is reported in the literature that there is a mutual relationship between the prosodic reading skill and comprehension and prosody has the closest relationship with reading comprehension compared to other fluency-related reading skills (Başaran, 2013; Yıldız, Yıldırım, Ateş, & Çetinkaya, 2009). Therefore, prosodic reading is considered to be the main indicator of reading comprehension.

The procedures mentioned above should be implemented concomitantly in order to achieve reading fluency. Without word recognition process, proper reading fluency and prosodic reading would be challenging to achieve. Intermittent reading prevents reader from establishing a relationship between words and sentences (Yıldız, 2013). In other words, text integration does not occur in reader's mind (Koda, 2005). Individuals who cannot acquire these skills may experience difficulty in reading comprehension. There might be a decrease in their desire to read and they may have difficulty developing reading habits (Akyol, 2012). According to Kuhn and Stahl (2004), honed fluent-related reading skills in primary school education can prevent academic failure likely to emerge in future. The skill of fluent reading cannot be improved straight after the acquisition of basic reading skills. Reading fluency can be improved with various activities, constant repetitions, and going through a certain process (Çayır & Ulusoy, 2014). However, previous research states that there is an absence of professional practices that act as tools to acquire these skills in classroom environment, fluent reading skills are neglected, and students experience difficulties in acquiring these skills (Baştuğ, 2012; Keskin, 2012; Sidekli, 2010; Yılmaz, 2006). It is possible to prevent such failures in the subsequent grades if different activities are applied to eliminate reading deficiencies that have been determined in the primary school period by taking the necessary precautions.

There are several studies in the literature about the elimination of reading deficiencies and the improvement of reading fluency (Çayır & Ulusoy, 2014; Kaya & Yıldırım, 2016; Keskin & Akyol, 2014; Keskin & Baştuğu, 2012; Rasinski, Yıldırım, & Nageldinger, 2011; Yıldırım, Ritz, Akyol, & Rasinski, 2015; Yıldırım, Çetinkaya & Ateş, 2009). These studies discuss the relationship between reading fluency and comprehension, the repetitive reading method, programs to improve fluency, structured education of reading fluency and genre-based reading fluency. Several techniques and education practices have been adopted to improve reading fluency; however, nursery rhymes have not been used for this purpose.

When learning to read and write, which are the most important skills acquired in primary school, nursery rhymes are frequently used. Nursery rhymes, which can be listed among the prominent products of Turkish folk literature and a genre that students encounter at an early age, know well, and enjoy reciting, are used in activities that aim to promote reading and help them acquire the skill of accurate reading - one of the components of reading fluently - by eliminating pronunciation mistakes. Furthermore, the melodious structure of nursery rhymes allows for the acquisition of prosodic reading, which is a fluency-related reading skill. By offering activities that involve nursery rhymes, the aim is to make students eager for reading and help them acquire fluent reading skills (Çer, 2016).

Children use different linguistic elements when they sing nursery rhymes. The harmony in the pronunciation of nursery rhymes makes students eager to take part in the activities (Dilci & Gür, 2012; Erdem, Şengül, Gün, & Büyükaslan, 2015). They become more disposed to learning their native language due to this property of theirs (Önal, 2009). Nursery rhymes support students in acquiring reading and fluent reading skills (Ungan, 2009). Putting emphasis on learning nursery rhymes and offering linguistic activities using nursery rhymes in primary schools would be beneficial for children in terms of language development (Kurudayıoğlu & Potur, 2015). Nursery rhymes are products that ensure students encounter different words, develop their reading and speaking skills, and support them in recognizing the possibilities of a language (Toker, 2011). Furthermore, it is stated that children can learn phonetics through games, nursery rhymes, and rhythmic activities and that the phonological awareness of children aged 5 to 7 years who memorize nursery rhymes increases (NAEYC, 2008).

Humor and tautophony in nursery rhymes catch the attention of students and make them more motivated to read nursery rhymes. Their unconscious exposure to tautophony prevents them from making pronunciation mistakes as they read. Nursery rhymes can be used to eliminate the problems encountered in word recognition, which is an indispensable component of reading fluency. Özkaya (2012) has revealed that learning nursery rhymes is highly effective in eliminating the problems encountered during reading.

Additionally, when students learn nursery rhymes, they not only have fun (Gunning, 2000) but also perform language practices. Nursery rhymes, which can be used for children with poor vocabulary and unable to complete their language development, are beneficial in terms of correct pronunciation (Dedeoğlu-Orhun, 2009; Yıllar & Turan, 2015).

Students add numerous words to their vocabulary by reciting nursery rhymes and by doing so they expand their vocabulary. In the first step, nursery rhymes can be utilized to work on sounds that children have difficulty pronouncing. Children pronounce sounds and words more accurately as they recite nursery rhymes (Tosunoğlu & Melanlıoğlu, 2006). Nursery rhymes, which contain both meaningful and meaningless words, ensure that students learn the correct pronunciation of a word in an entertaining and unusual fashion. The desire students have for reading increases as they learn new words and pronounce words better. This desire, in turn, contributes to the improvement of their reading skills. As students generally do not read words they do not recognize, They cannot comprehend the relationship between symbols and sounds, confuse words or letters, have difficulty spelling, change the order of, add to or remove the letters in a sentence and change or repeat words (Akyol, 2003).

Reading and reciting nursery rhymes play a significant part in the development of such features as pronunciation, intonation, emphasis, and articulation that are required for reading and speaking. It is difficult to recite nursery rhymes which are comprised of repetitions, tautophony, and associations. Students acquire the correct articulation of sounds and words and fluent speaking with nursery rhymes (Sever, Kaya, & Aslan, 2017). Word recognition skills of students are related to phonetics. Nursery rhymes have an important role in the accurate pronunciation of words. Students learn how to articulate vocals and pronounce words quickly as they recite nursery rhymes.

Most of the studies in the related literature have been conducted on the use of nursery rhymes in Turkish language teaching, particularly in speech training and teaching Turkish as a foreign language (Gökkaya, 2008; Gürbüz, 2004; Kurudayıoğlu & Potur, 2015; Önal, 2002; Sarıca, 2012; Ungan, 2009). However, in a study conducted on the improvement of fluent reading skills of third-grade students (Aşıkcan, 2019), nursery rhymes have been used, and it is stated that students recite difficult-to-pronounce nursery rhymes eagerly, easily, and fluently. In this context, it is considered that activities in which nursery rhymes are frequently used could improve fluent reading skills of students.

The aim of the present study was to answer the question "Do nursery rhymes have an effect on improving reading fluency of fourth-grade primary school students?" Accordingly, the answers to the following questions were also sought.

1. Do the activities involving nursery rhymes affect the reading rates, reading accuracy, and prosodic reading skills of students in the experimental group?

2. Is there a significant difference between the pre-test and post-test reading rates, reading accuracy, and prosodic reading scores of the control group?

3. Is there a significant difference between the pre-test and post-test reading rates, reading accuracy, and prosodic reading scores of the control and experimental group?

4. Is there a significant difference between the reading rates, reading accuracy, and prosodic reading scores of the control and experimental group? (Paired samples *t*-test)

Method

This section features the study design, sample, data collection tools, data collection, and data analysis.

Study Design

In this study a quasi-experimental design - an quantitative research method - was used. In quasi-experimental studies, an experimental group and a control group are impartially isolated from an existent group instead of creating artificial groups. In this sense, the authors of the present study created an experimental group and a control group out of the fourth-grade students of the school where the study was conducted.

The pretest-post-test non-equivalent group design, regarded as the most common semi-experimental design, was used in the study. In this design, the experimental and control groups are assigned. Both groups are given a pre-test and post-test and only experimental group receives the treatment (Creswell, 2016).

Study Group

The sample consisted of 44 fourth-grade students attending to a public primary school located in Vakfıkebir county of Trabzon province, Turkey, in the 2015-2016 academic year. The random sampling method, a probability sampling method, was adopted to produce the sample. Acquisition of a high level of reading fluency is available in the Turkish curriculum as an objective as of the second grade. The fourth grade is the final year of primary education and it is required for students who will attend secondary school to acquire an advanced level of reading fluency. As mentioned above, conducting studies on the determination and elimination of problems related to reading fluency in primary school could prevent academic failure that may occur in future education processes. In this context, the present study was conducted on fourth graders who were in the final year of their primary education and it was aimed to help them acquire and improve this skill before they start secondary school.

Activities including nursery rhymes were offered the students in the experimental group over 15 weeks and the effects of these activities on the reading rates, reading accuracy, and prosodic reading skills of these students were investigated. The experimental group consisted of 22 students (12 females and 10 males), while the control group to of 22 students (8 females and 14 males). No students were excluded from the analyses.

Data Collection

This section presents how the data were collected and what the data collection tools are.

Data Collection and Data Collection Tools

In this study, activities incorporating nursery rhymes were offered the students in the experimental group in 2-hour courses weekly for 15 weeks. Such parameters as aim, time management, classroom use, classroom organization, students' preliminary information, comprehension, suitability of materials, teachers' and students' rules, students' roles, difficulties experienced by students, assessment and evaluation, and flexibility (Özmantar & Bingölbali, 2009) were considered while designing the activities. The activities were incorporated into the daily lesson plans in accordance with the research aim. The activities with nursery rhymes, which were developed by the researcher, were linked with the acquisitions in the Turkish course curriculum. They were developed in consideration of the aimed skills and acquisitions for the 2015 Turkish course curriculum of the Ministry of National Education. Nursery rhymes, which are also known as fallacies and twists, were used in the activities to eliminate pronunciation problems.

The parents, the principals, and the classroom teachers of the participating fourth graders in the control group were informed about the study before it was launched. The participation was voluntary and the participating students were also informed about the content of the study. The permissions were obtained from the parents for the video recordings carried out for the purpose of the study. The audible readings conducted before and after the practices were performed with each student individually. The students were in no way guided by the researcher before the reading practice. They were encouraged to start reading when they felt ready. The researcher followed the reading of the students with the guide text and video-recorded them while they were reading. As each student volunteered for the study and performed the reading practice accompanied by his/her teacher, it was observed that they were comfortable while reading.

A text that the students had never encountered before, unavailable in the Turkish coursebooks, published by a different publishing house, and approved by the Ministry of National Education was used in order to collect the study data. To determine the most suitable nursery rhymes for the fourth-grade students, the opinions of two classroom teachers, a Turkish language teacher and an expert academician, were considered. The chosen texts were read by the students in both groups in order to determine their reading rates and reading accuracy percentages and this process was recorded by a video recorder. The students in the experimental group adopted different reading fluency strategies, methods, and techniques in 78 different nursery rhymes with various alliterations as the activities were performed and attempted to recite each nursery rhyme. The students were made to read the texts after they had participated in the activities involving nursery rhymes and the readings were recorded in order to determine the effect of nursery rhymes on their reading fluency. The data obtained before and after the treatment with a video recorded were analysed with a computer.

The students in the control group performed the reading and listening activities in the Turkish language coursebooks. The classroom teacher of the students in the control group did not have recourse to any special methods, techniques, strategies, or activities that would improve the reading fluency of the students apart from those available in the coursebooks. Since the texts used in the study were found in a Turkish coursebook by a different publishing house and

were not used in the Turkish courses of the school of the students in the experimental group, the control group did not perform any activities based on this text. Furthermore, the students in the control group did not do any nursery rhyme readings.

One of the three components of fluent reading is reading rate. In this study, the number of accurate words per minute was considered as the reading rate. Only the number of words read accurately was evaluated, thus allowing to exclude the readings that students would intentionally or mistakenly read. Thus, in order to evaluate the reading rates, the mistakes were subtracted from the number of total words read. This method, the reliability and validity of which were accepted, is known as a program-based measurement approach and is considered a strong indicator of reading-aloud fluency (Keskin, 2012). In this method, the suitable texts are read aloud for one minute and the reading is recorded by a video recorder. When one minute is over, the number of the read words are counted, the misread words are determined, and the number of words read accurately is found by extracting the misread words from the number of total words (Akyol, 2014; Baştuğ, 2012; Keskin, 2012). In this study, the audible readings of the students were recorded and a guide text was developed in which the number of words in each line was written at the end of the line in order to determine the reading rate. The video recording of each student was reviewed, the lines that the students read in the guide text in one minute were determined, and the number of the total read words was found. Then, the misreadings were determined by watching the video recording of each student several times. The required calculations were made by processing the number of the total read words and the misreadings with a computer.

Another component that facilitates reading fluency is accurate reading. It is stated in the literature that experiencing difficulty in reading accurately also negatively affects fluent reading and it is required to exhibit accurate reading in order to perform fluent reading (Akyol, 2014; Baştuğ, 2012; Keskin, 2012). Audible reading, which is recording the reading process and determining the number of the total read words, and misreadings by listening to the recorded readings form the basis of accurate reading. The number of the misread words is extracted from the number of the total read words and thus the number of the accurately read words is determined. Since reading accuracy is expressed as the accurate reading percentage, the number of accurately read words is divided by the number of the total read words and the result is multiplied by 100 and thus the reading accuracy percentage is determined. The accurate reading percentage is formulated as “Number of accurately read words/number of total read words X 100 = reading accuracy percentage”. The reading accuracy percentage allows to classify students’ levels into three, i.e. free level, education level, and anxiety level (Baştuğ, 2012; Keskin, 2012). In this study, the video recordings of the students were viewed repeatedly in order to determine the accurate reading percentages and the data were typed in a computer to perform the necessary calculations.

It is required to determine the mistakes of the students in audible readings for the measurement of reading rate and reading accuracy. In this study the Error Analysis Inventory, which was adapted for Turkish academic works by Akyol (2012) and includes error types such as repetitions, skips, additions, reversing, alterations, and misreads in order to determine the audible misreadings, was used. The words with these mistakes were regarded as misreadings and extracted from the number of the total read words.

Data Analysis

The data that were obtained from the measurement tools were analysed with SPSS 22, a statistical analysis program, and depending on the sub-problems of the study the independent samples *t*-test (third and fourth sub-problems) and paired samples *t*-test (first and second sub-problems) were used in the analyses of the data.

The paired samples *t*-test, a parametric statistical analysis test, was used for the dependent samples in order to determine whether there was a statistically significant difference between the averages of the values concerning the fluent reading skills that were obtained as a result of the separate pre-test and post-test measurements from the experimental and control groups. The independent samples *t*-test was used to determine whether there was a statistically significant difference between the averages of the values of the fluent reading skills that were obtained as a result of the pre-tests and post-tests of the experimental and control groups.

The effect size values were calculated to be able to make accurate decisions about the obtained results by removing the results arising from the number of the samples used in the study (Özsoy & Özsoy, 2013). Cohen’s *d* statistic was also used in this study. Regardless of the notation, Cohen’s *d* value was interpreted as small, medium, and large effect size if the values were 0.2, 0.5, and 0.8, respectively (Cohen, 1988). In determining the significant difference, *p* value was accepted to be .05.

Findings

In this section, the results of the pre-tests and post-tests of the experimental and control groups that were analysed in order to find answers to the questions determined as the sub-purposes of the study and the interpretations of these results are provided.

Findings Related to the Sub-Problems of the Study

The findings related to the sub-problem "Do the activities involving nursery rhymes affect the reading rates, reading accuracy, and prosodic reading skills of the students in the experimental group?”:

Table 1. *Paired samples t-test results of the pre-test and post-test reading rate scores of the experimental group*

Experimental Group	*N*	Mean	*SD*	*df*	*t*	*p*
Pre-Test	22	78.45	23.89	21	-14.46	.001
Post-Test	22	102.18	26.66			

p < .05

According to the results of the paired samples *t*-test, based on which the effect of the activities with nursery rhymes on the reading rate was researched, a significant difference was observed between the average reading rate scores before the activities ($M_{pre\text{-}test}$ = 78.45) and the average reading rate scores after the treatment ($M_{post\text{-}test}$ = 102.18) ($t_{(22)}$ = -14.46; p < .05). The effect size calculated in the test (d = 2.4) indicated that this difference was substantially high (Cohen, 1988). This manifested that the activities that included nursery rhymes, which were performed in the experimental group, had a significant effect on the reading rates.

Table 2. *Paired samples t-test results of the pre-test and post-test accurate reading scores of the experimental group*

Experimental Group	*N*	Mean	*SD*	*df*	*t*	*p*
Pre-Test	22	90.67	6.18	21	-6.03	.001
Post-Test	22	95.89	3.37			

p < .05

According to the results of the paired samples *t*-test, based on which the effect of the activities with nursery rhymes on the

accurate reading was researched, a significant difference was observed between the average accurate reading scores before the activities ($M_{pre\text{-}test}$ = 90.67) and the average accurate reading scores after the application ($M_{post\text{-}test}$ = 95.89) ($t_{(22)}$ = -6.03; p < .05). The effect size calculated in the test (d = 1.2) indicated that this difference was considerably high (Cohen, 1988). This indicated that the activities incorporating nursery rhymes, which were performed in the experimental group, had a significant effect on accurate reading.

Table 3. *Paired samples t-test results of the pre-test and post-test prosodic reading scores of the experimental group*

Experimental Group	*N*	Mean	*SD*	*df*	*t*	*p*
Pre-Test	22	2.13	0.56	22	2.85	0.42
Post-Test	22	2.85	0.42			

p < .05

According to the results of the paired samples *t*-test, which was conducted in order to determine whether or not there was a difference between the prosodic reading scores before and after the treatment of nursery rhymes, a significant difference was observed between the average prosodic reading scores before the activities ($M_{pre\text{-}test}$ = 2.13) and the average prosodic reading scores after the activities ($M_{post\text{-}test}$ = 2.85) ($t_{(22)}$ = -8.73; p < .05). The effect size calculated in the test (d= 1.2) indicated that this difference was very high (Cohen, 1988), which revealed that the activities that included nursery rhymes and were performed in the experimental group had a significant effect on prosodic reading.

The findings regarding the sub-problem "Is there a significant difference between the pre-test and post-test reading rates, reading accuracy, and prosodic reading scores of the control group?":

Table 4. *Paired samples t-test results of the pre-test and post-test reading rate scores of the control group*

Experimental Group	*N*	Mean	*SD*	*df*	*t*	*p*
Pre-Test	22	72.54	14.24	21	.616	.545
Post-Test	22	71.68	12.66			

p < .05

In Table 4, the *t*-test results of the pre-test and post-test reading rate scores of the control group are given. According to these results, there were no significant differences between the pre-test and post-test reading rate scores of the control group ($t_{(22)}$ = .616; p > .05). The average reading rate scores of the control group from the pre-test were calculated to be ($M_{(pre\text{-}test)}$ = 72.54), while the average reading rate scores from the post-test to be ($M_{(post\text{-}test)}$ = 71.68)

Table 5. *Paired samples t-test results of the pre-test and post-test accurate reading scores of the control group*

Experimental Group	*N*	Mean	*SD*	*df*	*t*	*p*
Pre-Test	22	92.20	4.88	21	.583	.566
Post-Test	22	91.64	5.43			

p < .05

In Table 5, the *t*-test results of the pre-test and post-test accurate reading scores of the control group are given. According to the results, no significant differences were found between the pre-test and post-test accurate reading scores of the control group ($t_{(22)}$ = .583; p > .05). The average accurate reading scores of the control group from the pre-test were calculated to be ($M_{pre\text{-}test}$ = 92.20) and the average accurate reading scores from the post-test to be ($M_{(post\text{-}test)}$ = 91.64)

Table 6. *Paired samples t-test results of the pre-test and post-test prosodic reading scores of the control group*

Experimental Group	*N*	Mean	*SD*	*df*	*t*	*p*
Pre-Test	22	2.27	0.62	21	1.103	.282
Post-Test	22	2.20	0.59			

p < .05

In Table 6, the *t*-test results of the pre-test and post-test prosodic reading scores of the control group are given. According to these results, there were no significant differences between the pre-test and post-test prosodic reading scores of the control group ($t_{(22)}$ = 1.103; p>.05). The average prosodic reading scores of the control group from the pre-test were calculated to be ($M_{(pre\text{-}test)}$ = 2.27), while the average prosodic reading scores from the post-test to be ($M_{(post\text{-}test)}$ = 2.20)

The findings on the sub-problem of "Is there a significant difference between the pre-test and post-test reading rates, reading accuracy, and prosodic reading scores of the control and experimental group?":

Table 7. *Independent samples t-test results of the pre-test reading rate scores of the experimental group and the control group*

Group	*N*	Mean	*SD*	*df*	*t*	*p*
Experimental	22	78.45	23.89	42	.-997	.325
Control	22	72.45	14.24			

p < .05

In Table 7, the *t*-test results of the pre-test reading rate scores of the experimental and the control group are given. According to the results, no significant difference was determined between the pre-test reading rate scores of the experimental and control groups (t*(42)* = .-997; p > .05). The averages reading rate scores of the groups were calculated to be (M = 78.45) for the experimental group and (M = 72.45) for the control group.

The fact that there were no significant differences between the pre-test reading rate scores of the experimental and the control group indicated that the reading rates of the groups were similar before the application.

Table 8. *Independent samples t-test results of the pre-test accurate reading scores of the experimental group and the control group*

Group	*N*	Mean	*SD*	*df*	*t*	*p*
Experimental	22	78.45	23.89	42	.-997	.325
Control	22	72.45	14.24			

p < .05

In Table 8, the t-test results of the pre-test accurate reading scores of the experimental and control groups are given. According to these results, there were no significant differences between the accurate reading scores of the groups ($t_{(42)}$ = .908; p > .05). The averages of the accurate reading scores of the groups were calculated to be (M = 90.67) for the experimental group and (M = 92.20) for the control group.

The fact that there were no significant differences between the pre-test accurate reading scores of the experimental and the control group indicated that the accurate reading levels of the groups were similar before the application.

In Table 9, the t-test results of the pre-test prosodic reading scores of the experimental and control groups are given. According to the results, there were no significant differences between the prosodic reading scores of the experimental and control groups ($t_{(42)}$ = .772; p > .05). The averages of pro-

sodic reading scores of the groups were calculated to be (M = 2.13) for the experimental group and (M = 2.27) for the control group.

Table 9. *Independent samples t-test results of the pre-test prosodic reading scores of the experimental group and the control group*

Group	*N*	Mean	*SD*	*df*	*t*	*p*
Experimental	22	2.13	.568	42	.772	.444
Control	22	2.27	.628			

p < .05

The fact that there were no significant differences between the pre-test prosodic reading scores of the experimental and the control group indicated that the prosodic reading scores of the groups were similar before the application.

The findings regarding the sub-problem "Is there a significant difference between the post-test reading rates, reading accuracy, and prosodic reading scores of the control and experimental group?":

Table 10. *Independent samples t-test results of the post-test reading rate scores of the experimental and control group*

Group	*N*	Mean	*SD*	*df*	*t*	*p*
Experimental	22	102.18	26.66	42	-4.847	.001
Control	22	71.68	12.66			

p < .05

According to the results of the paired samples *t*-test, which was conducted in order to reveal whether the activities involving nursery rhymes had a significant effect on the reading rates, a significant difference was observed between the average test scores of the students in the experimental group ($M_{(experimental)}$ = 102.18) and the average test scores of the students in the control group ($M_{(control)}$ = 71.68) ($t_{(42)}$ = -4.847; p < .05). Accordingly, it can be stated that the activities that involved nursery rhymes had a significant effect on the reading rates.

Table 11. *Independent samples t-test results of the post-test accurate reading scores of the experimental group and the control group*

Group	*N*	Mean	*SD*	*df*	*t*	*p*
Experimental	22	95.89	3.37	42	-3.118	.003
Control	22	91.64	5.43			

p < .05

According to the results of the paired samples *t*-test, which was conducted in order to reveal whether the activities incorporating nursery rhymes had a significant effect on accurate reading, a significant difference was observed between the average test scores of the students in the experimental group ($M_{(experimental)}$ = 95.89) and the average test scores of the students in the control group ($M_{(control)}$ = 91.64) ($t_{(42)}$ = -3.118; p < .05). Accordingly, it can be stated that the activities had a significant effect on accurate reading.

Table 12. *Independent samples t-test results of the post-test prosodic reading scores of the experimental group and the control group*

Group	*N*	Mean	*SD*	*df*	*t*	*p*
Experimental	22	2.85	.420	42	-4.181	.001
Control	22	2.20	.593			

p < .05

According to the results of the paired samples *t*-test, which was conducted in order to reveal whether activities with nursery rhymes had a significant effect on prosodic reading, a significant difference was observed between the average test scores of the students in the experimental group ($M_{(experimental)}$ = 2.85) and the average test scores of the students in the control group ($M_{(control)}$ = 2.20) ($t_{(42)}$ = -4.181; p < .05). Accordingly, it can be stated that such activities had a significant effect on accurate reading.

Conclusion and Discussion

This study aimed to improve the reading fluency of fourth-grade students with activities incorporating nursery rhymes and investigated whether there was an improvement in the reading fluency of the students as a result of these activities.

When the scores of the experimental and the control group from the pre-test were compared, it was observed that the reading rates, reading accuracy, and prosodic reading scores showed similarities and there were no differences between the groups in terms of these scores.

The study found that there was a significant difference between the reading rates, reading accuracy, and prosodic reading skills of the students in the experimental group when their pre-test and post-test data were compared. There was an increase of 23.73 points in the reading rates, 5.22 points in the reading accuracy, and .72 points in the prosodic reading skill of the students in the experimental group. This result complies with those of the studies in the literature, in which special methods used for the improvement of reading fluency have resulted in improved reading fluency of various groups (Baştuğ & Kaman, 2013; Çayır & Ulusoy, 2014; Duran & Sezgin, 2012a; 2012b; Keskin & Akyol, 2014; Şafak & Kaman, 2013; Ulu & Başaran, 2013; Uysal, 2018; Yılmaz, 2008).

It was observed that there was a significant difference in the reading rates, reading accuracy, and prosodic reading skills in favour of the experimental group when the scores of the experimental and the control group were compared after the practice. It was considered that in addition to the in-class studies performed on the students in the experimental group, the activities with nursery rhymes affected the increase of their reading rates. It can be stated that the activities involving nursery rhymes significantly affected the automatization of the reading accuracy (word recognition) of the students. According to previously conducted studies, texts including vocals, syllables, and word repetitions are effective in improving reading fluency and it is considered that nursery rhymes can be an effective tool to help students acquire these skills.

There were no studies in the literature that have examined the effects of nursery rhymes on reading fluency. However, in his study on reading fluency, Aşıkcan (2019) has included nursery rhymes in addition to reading techniques that are frequently used in studies.

Although there are no studies about the relationship between nursery rhymes and reading fluency, there is a great number of studies indicating that nursery rhymes are effective in language education. Available research indicates that nursery rhymes improve phonological skills and affect reading (Bradley & Bryant, 1983; Bryant, Bradley, Maclean & Crossland, 1989; Ehri & Robbins, 1992; Kurudayıoğlu & Potur, 2015; Ungan, 2009; Özkaya, 2012; Patride, 1992; Stanovich, Cunningham & Cramer, 1984; Şentürk, 2008). There are also studies that have revealed that nursery rhymes are effective in improving speaking skills (Erdem, 2013; Gökkaya, 2008; Orhun, 2009). Furthermore, there are studies indicating that nursery rhymes are effectively used in foreign language education (Baleghizadeh & Dargahi, 2010; Erdem at al., 2015; Gordon, 2007; Gürbüz, 2004; Pinter, 2006; Prosic-Santovac, 2015; Sarıca, 2013; Snow, Burns & Griffin, 1998).

In the present study, the students in the experimental group were given the opportunity to improve their reading fluency

through activities that included nursery rhymes and it was concluded that they read more fluently compared to the students in the control group. Correct pronunciation, paying attention to speed, emphasis, and intonation form the basis of nursery rhymes. The sounds, syllables, and word repetitions in nursery rhymes ensure that linguistic practices can be performed while having fun. Nursery rhymes, which appeal to students due to their entertaining properties, significantly contributed to the improvement of the reading fluency of the experimental group. Nursery rhymes can take part in the literature as products that can be used to improve the reading fluency of students.

Suggestions

- Activities that include nursery rhymes have been effective in the improvement of students' reading fluency. Thus, teachers should offer these activities in Turkish courses by adapting them to the grades of students.

- Teachers should present their students with nursery rhyme reciting activities in Turkish courses in order to improve their students' reading skills.

- Families should be informed about the activities that can be performed with students with reading disabilities and encouraged to support nursery rhyme reciting activities.

- Researchers could practice activities that include nursery rhymes with students in different grades and share the results.

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Creating a Community of Caring within a School

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Abstract

Students often arrive at school not ready to learn due to stress and trauma. In order to thrive in school, students need to know that within the school is an intentional, multi-layered system of caring. This manuscript details strategies at the individual, classroom, and school level. Having targeted strategies to assist students is essential in creating a caring community within the school context.

Keywords: Caring, Stress, Trauma, Community, School

Introduction

Children who are exposed to trauma are at risk for developing emotional or behavioral problems, including dysregulation, posttraumatic stress disorder (PTSD), depression, low self-esteem, and aggression (Beltran, Brown-Elhillali, Ryce, Ofonedu, Hoover, & Belcher, 2016). There is research to support that behavior in the classroom can increase teacher workload, stress level, and may be correlated to teacher burnout rates (Friedman-Krauss & Raver, 2014). A potential strategy to alleviate these issues could be the use of student interventionists in a peer-mediated intervention to build community within the classroom. Student interventionists have served as effective change agents in school settings for both academic problems (Dufrene, Henington, & Townsend, 2006; Dufrene, Reisener, Olmi, Zoder-Martell, McNutt, & Horn, 2010) and behavior problems (Arceneaux & Murdock, 1997).

The following manuscript details strategies for creating a community of caring within the school context. Needs of children entering our classrooms each day are demanding on teachers which can increase the stress level of the classroom. Schools are faced with the unique challenge of meeting the needs of children and supporting teachers while creating an enriching educational atmosphere. Below six strategies total are presented with two strategies highlighted at the individual, classroom, and school levels. The following strategies are practical ideas for establishing a culture of a caring community within the school setting. However, each situation is unique and should be evaluated by appropriate professionals to ensure best practice.

Strategy #1: Individual Level - Mentoring Program

A mentorship is a dynamic and reciprocal relationship that can be beneficial for both the child and the mentor (Burrell, Wood, Pikes, & Holliday, 2001). Community and home-based adult mentors can protect and support a student's resiliency towards overcoming trauma. Children with a mentor, such as a teacher or coach, who support efforts through encouragement and belief, were identified as having higher resilience than those without mentors (Walsh, 2003). Also, when adult mentors demonstrate continued confidence and consistent support in children, the children were far better in adaptive skills than students without an adult mentor (Wong, 2003). According to Blum, McNeely, and Nonnemaker (2002), children were found to benefit from having a stable, trustworthy, non-familial adult on whom they could rely. External mentorship can contribute to growth in all areas of a person's life, in part because mentorship is a combination of multiple processes. These processes include investments of thought, time, and effort that create a capacity for people to expand their capabilities in all capacities of their life (Burrell et al., 2001).

Strategy #2: Individual Level - Give Hugs, High-fives, or Pats on the Shoulder

Oxytocin is a chemical in our bodies that scientists sometimes call the "cuddle hormone" because levels rise when we hug or sit close to someone else. Oxytocin is associated with happiness and less stress (Cirino, 2018). According to a study conducted by Olff, Langeland, Witteveen, and Denys (2010), oxytocin has been implicated in the pathophysiology of psychiatric disorders. The disorders include abnormal stress regulation as well as disrupted attachment and/or social deficits (e.g., social withdrawal) such as autism, obsessive-compulsive disorder, social phobia, borderline personality disorder, mood disorder, and PTSD. The release of oxytocin reduces amygdala activation and decreases the brain regions involved in automatic and behavioral responses to fear. Young and Wang (2004) link oxytocin with neuroendocrine and psychosocial stress reduction.

Cortisol is public health enemy number one (Bergland, 2013). Ironically, this chemical in our own body, which was designed to activate the fight-or-flight mechanism, could silently harm us. According to Bergland (2013), both eustress and distress release cortisol as part of the general adaptation syndrome. Once the alarm to release cortisol has sounded, your body becomes mobilized and ready for action — but there has to be a physical release of the "fight-or-flight" chemical. If the body fails to release it, cortisol levels build up in the blood, which wreaks havoc on your mind and body. Elevated cortisol levels can interfere with memory and learning, lower immune system functioning and bone density, increase weight gain, blood pressure, cholesterol, and heart disease. Chronic stress and higher cortisol levels also increase one's risk for depression, mental illness, and lower life expectancy.

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Oxytocin has been observed to reduce the levels of cortisol in the body and lower blood pressure (Dvorsky, 2012). The "tend-and-befriend" response increases oxytocin and reduces cortisol (Bergland, 2013). This response is the exact opposite to "fight-or-flight." The "tend-and-befriend" response is linked to increasing healthy social groups to reduce vulnerability, and contributing to the development of social networks (Taylor, Klein, Lewis, Gruenewald, Gurung, & Updegraff, 2000).

A hug, high-five, or pat on the shoulder can make a person feel safe, secure, and can help reduce their fears. Very rarely is the importance or impact of a hug, high-five, or pat on the shoulder given much thought. A hug, high-five, or pat on the shoulder releases oxytocin which leaves a person feeling tranquil and loved. Oxytocin, along with dopamine and norepinephrine, are believed to be highly critical in human pair-bonding (Dvorsky, 2012).

During a hug, high-five, or pat on the shoulder, oxytocin is distributed throughout the body causing stress reduction and an increase in mood regulations. Through the physical connection, oxytocin can alleviate social anxieties and produce feelings of trust (Dvorsky, 2012; Kosfeld, Heinrichs, Zak, Fischbacher, & Fehr, 2005). According to Cirino (2018), even touching an inanimate object, such as a teddy bear, can help reduce people's fears about their existence.

Hugs, high-fives, or pats on the shoulder are essential for people with traumatic stress. Oxytocin has been proven to be a natural form of an antidepressant (Dvorsky, 2012). Early stress and abuse experiences (particularly childhood emotional abuse and neglect and early parental separation) seem to disrupt the normal development of oxytocin in children. This development is a critical mechanism to regulate emotional behaviors (Olff et al., 2010). Children with adverse childhood experiences need more oxytocin, which means they could benefit from more hugs, high-fives, or pats on the shoulder. It is important to note school policies and children's personal preferences. One idea to consider is to create a chart where the children choose how they prefer to be greeted each day; for example, a high five might help today, but a simple wave might be preferred the next day.

Strategy #3: Classroom Level - Classroom Champions

The protégé effect, or using peer-to-peer techniques, can be useful not only in the classroom but in developing a healthier, more positive school culture (Price, 2019). When administrators and teachers give students ownership in their learning environments, it creates a sense of pride in students (Price, 2019). An example of how this might work in a classroom is when a student enrolls in school, they will be matched with an identified classroom champion "champ." Students chosen to be classroom champs show leadership skills in knowing school and classroom procedures and have the ability to collaborate well with others. Their role is to welcome new students into the classroom until they have been onboarded successfully into the classroom's culture. The classroom champ's job is to give the new student an initial tour, introduce them to their classmates, teach them their school procedures, and befriend them through this challenging transition. Have the champ greet them each morning upon arrival and walk with them into the classroom. Examples of collaborations might also include things such as playing at recess, eating lunch together, being teammates on a project, etc.

By creating this autonomy within the classroom, character traits, such as—friendship, perseverance, responsibility, respect, self-discipline, cultural sensitivity, and courage—are built (Sheasley, 2019). Belonging in the classroom means ensuring that all students feel welcomed, comfortable, and part of the school family (Dunlea, 2019). Teachers could regularly refer to the character traits in class and consistently link them to learning targets—emphasizing that the traits will help students develop into "their best self". Students and staff share the responsibility for creating a culture of respect and safety, as well as working hard to break down misconceptions that can stand in the way of progress (Sheasley, 2019).

An extension would be to match families together as adult versions of classroom champs, so the families also have a go-to person to ask questions and for reminders or clarity on processes. It is imperative that every child and family feel welcomed in classrooms. Families and schools belong together. They're all strengthened when parents come inside, get acquainted with teachers, and get involved in their kids' learning (Boss, 2010).

Strategy #4: Classroom Level - Continuity of Care

Looping, the practice of keeping a group of children with the same teacher for more than a year, has the potential to provide a consistent caregiver during the young child's critical period of attachment and emotional development (Nitecki, 2017). Looping occurs when a teacher is promoted with her students to the next grade level. "Continuous learning," "continuity of care," "continuous progress," or "persisting groups," is the practice of keeping the same caregiver or teacher with a group of children for two to three years (Lab at Brown University, 1997). This classroom practice builds on attachment and continuity of care. The practice of looping stresses long-term relationships, so students of the same age group remain with the same teacher for more than one school year, while multi-age classrooms may have a different teacher year after year (Nitecki, 2017).

Blum, McNeely, and Nonnemaker (2002), found that students benefit from having a stable, trustworthy, non-familial adult they could rely on. Looping provides children with additional time to build the trust and relationships on which much of their learning depends (Haslinger, Kelly, & O'Lare, 1996). In this setting, children develop stronger social bonds with their peers, are better able to resolve conflicts, and are more skillful in working as team members to solve problems. Looping is especially important for young children, whose social emotional foundation is being built through attachments with parents and caregivers (Nitecki, 2017). . According to Murgatroyd & Spengler (2011), there is evidence linking early experiences and stressors to physical and emotional problems. The researchers state a solid preventive measure is attachment that a consistent, trustworthy adult could provide. Recent findings based on the implications of epigenetics magnify the need to prioritize the child's need for attachment, especially in settings outside of the home (Nitecki, 2017). The main caregivers are responsible for the "blueprint for baby's own emotional regulations and future expectations of relationships" (KarrMorse & Wiley, 2012, p. 98). To prevent the negative effects of stress on the child's developing and fragile system, there should be a solid consistent base of attachment (Nitecki, 2017), like those found in looping.

During infancy, toddlerhood, and leading up to age five, there is an "emotional vulnerability of the immature system that is so overlooked in our culture" (Karr-Morse & Wiley, 2012, p. 97). The widely held opinion about young children is that trauma experienced at a young age is "erased over time, lost in the fog of early experience" (p. 92). This is simply not true. The brains of young children are particularly tuned to both positive and negative emotions in surroundings (Nitecki, 2017). Our schools are where students spend a majority of their day. Within the context of a safe, familiar environment (ex. school settings) with a steady caregiver, attachment can form, which leads to self-regulation, and ultimately maintaining physical, cognitive, and emotional health (Nitecki, 2017).

Strategy #5: School Level - Supportive Peers

Students who experience trauma need to know that they are not alone. Trauma-informed peer support emerged as an alternative to traditional psychiatric hospitalization and has been at the cutting edge of developing new practices for responding to crisis (Felton, 2003). Peer support is grounded in the knowledge that crisis can be transformative, that mutually supportive relationships provide necessary connection, and that new contexts offer new ways of thinking about one's experience. Supportive peers proactively create plans that serve as guidelines to the kinds of interactions and activities that will benefit the student. The situation is shared rather than "handled," and it offers an opportunity for the peer community to learn and grow (MacNeil & Mead, 2005). Peers can mature together in small groups and learn from each other's challenges based on similar experiences. Oxytocin levels are increased by close relationships and social support, and reduced by sad emotions or social isolation. There is a clear association between oxytocin and the experience of social support (Kosfeld et al., 2005). Peer supports in mental health settings for children who have experienced trauma often mean having peers who have experienced similar hardships working together to address needs (Substance Abuse and Mental Health Services Administration [SAMHSA], 2014). This can be implemented in the school setting as well. In a study conducted by Heinrichs, Baumgartner, Kirschbaum, and Ehlert (2003), students who received both protective factors of social support and oxytocin exhibited the lowest cortisol concentrations during stress exposure, whereas students who received no social support and placebo demonstrated the highest cortisol response. Also, students that have more secure attachments in relationships may be related to having a more positive alliance with therapists, peers, educators, and to their outcomes (Olff et al., 2010).

Strategy #6: School Wide - Therapeutic Toolbox

Students who have been traumatized may exhibit a number of challenging behaviors. The multifaceted nature of these challenges often makes such students candidates for individualized behavior support (Cavanaugh, 2016). Certain people or situations may remind the student of their traumatic experience, which could trigger a student's aggressive behavior in the classroom. Once these triggers are identified, support plans can be developed that remove or adjust these antecedents (Crone, Hawken, & Horner, 2015). It is critical to find time throughout the day for students to demonstrate their strengths and be provided opportunities to engage in activities that interest them (Cavanaugh, 2016). As educators, it is important to celebrate the "small wins". Supporting students with multitiered school-wide supports (MTSS) gives them a safe place to talk about an experience, describe a fear, relieve frustrations, or in some cases, simply provides a friendly face to say hello to everyday. Within some systems of MTSS, the supports include screening, check-in/check-out (CICO), yoga, breathing techniques, and social skills instruction (Bruhn, Lane, & Hirsch, 2014; Telles, Singh, & Balkrishna, 2012). By giving students these supports in their therapeutic toolbox, it helps establish a safe environment for them to thrive. In order to be successful, it has been determined that schools must develop, teach, and reinforce at least three to five of these school-wide expectations. (Horner, Sugai, & Anderson, 2010).

Conclusion

There are numerous strategies at the various levels (i.e. individual, classroom, and school) that can be implemented to help students cope with a variety of stressors. Educators of students with stress and/or trauma need to be aware of its impact on children, and the most effective ways to address their educational and social needs. Having practical strategies to assist students is essential in creating a community of caring within the school. A simple smile or wave "hello" can provide a strong start to the day. In this manuscript, strategies for building a community of caring within the school are detailed. Each school should consider their unique culture and work collaboratively with students, teachers, staff, administrators, families, and the community to establish a positive, caring atmosphere where optimal learning can occur.

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