



## Teachers' Views Regarding the Implementation of First Grade Mathematics Curriculum in Villages : A Case Study – Şanlıurfa

### İlkokul 1. Sınıf Matematik Öğretim Programının Köy Okullarında Uygulanmasına yönelik Öğretmen Görüşleri: Şanlıurfa Durum Çalışması

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#### Öz

Bu nitel çalışmada yarı-yapılandırılmış görüşme soruları köyde görev yapan 12 birinci sınıf öğretmenine yöneltilmiştir. Çalışmanın amacı köyde görev yapan 1. Sınıf öğretmenlerinin Matematik Öğretim Programının uygulanmasını yönelik görüşlerini belirleyerek sınırlıklarını ortaya koymak ve önerilerini almaktır. Çalışmanın katılımcılarını köylerde görev yapmakta olan oniki gönüllü 1. Sınıf öğretmeni oluşturmuştur. Katılımcıların onu birinci sınıf öğretmeni, ikisi ise birinci sınıfı da içeren birleştirilmiş sınıf öğretmenidir (Bir katılımcı 1. ve 3. Sınıf, bir katılımcı ise 1. ve 2. sınıfı birleştirilmiş sınıfta okutmaktadır). Çalışmanın bulguları “1. Sınıf Programlarının Uygulanmasını Etkileyen Faktörler” ve “1. Sınıf Matematik Öğretim Programının Uygulanmasını Etkileyen Faktörler” olmak üzere iki tema altında toplanmıştır. 60-66 aylık çocuklar, Okulun fiziksel imkânları, Okul öncesi eğitimi almış olma ve Diğer kategorisi birinci temayı oluşturmuş ve “1. Sınıfta okutulan bütün derslerin programlarını etkileyen faktörler” olarak isimlendirilmiştir. Bu tema altında öğrencilerin farklı gelişim seviyelerinde olması, soğuk sınıflar, tek sınıftan oluşan okullarda görev yapmak, okul öncesi almış öğrencilerin el kaslarının gelişmiş olması, etkinliklere gönüllü katılım sağlamaları, okula uyum sürecinin hızlı gelişmesi kodları ortaya çıkmıştır. “Diğer” kategorisi farklı kodların yer aldığı bir kategori, olarak velilerin destek vermemesi, etkili öğretmen el kitabı, hizmet içi eğitim talebi ve kitaplarda örnek oyunlara yer verilmesi talebi yer almaktadır. İkinci tema olan “1. Sınıf Matematik Öğretim Programını Etkileyen Faktörler” teması altında içerik, kazanım, materyal sınırlığı, etkili öğretim yöntemleri kodları yer almaktadır. “Sayılar ve İşlemler” öğrenme alanında 3 sayısı ile “E” harfinin karıştırılması nedeniyle zorluk yaşandığı, 9’dan 5’e geriye saymada zorluk, 6 ve 9’un karıştırılması, 0’ın öğretilmesi konularında sıkıntı yaşantığı ortaya konulmuştur. Geometrik modeller ve 10’luk sayma küplerine ihtiyaç duyulduğu, bazı kazanımları gerçekleştirmede zorluk yaşandığı, “Toplama işleminde toplananların yerleri değiştiğinde toplamın değişmediğini fark eder” kazanımını konuyu açıklamadan fark ettirmenin zorluğunun altı çizilmiştir. Bütün yarım ve çeyrek kavramlarına yönelik modellere ihtiyaç duyulduğu belirtilmiştir. Oyun, drama ve müzikal-ritmik zekânın kullanımı matematik konuları öğretiminde etkili yöntemler olarak belirtilmiştir.

#### Abstract

In this qualitative study, semi-structured interview questions were asked to twelve 1<sup>st</sup> grade classroom teachers working in villages. The aim of the study is to specify 1<sup>st</sup> grade classroom teachers' needs, views and suggestions regarding the implementation of the 1<sup>st</sup> grade Mathematics curriculum. Twelve classroom teachers, ten of whom are first grade teachers and two of whom are multi-grade class teachers (one of them covers the content of 1<sup>st</sup> grade and 3<sup>rd</sup> grade together, and the other covers 1<sup>st</sup> and 2<sup>nd</sup> grader course content) voluntarily participated in the study. Two themes emerged from the interviews: factors affecting the 1<sup>st</sup> grade curricula and factors affecting 1<sup>st</sup> grade Mathematics Curriculum. Under the first theme, 60-66 month-old children, the effect of pre-school education, and physical conditions of schools emerged as categories. The “Other” category under the first theme included the participants' suggestions like making pre-school education obligatory and taking into account schools with one classroom by central curriculum development team. Under the second theme, the categories of attainment, content, materials, and effective instructional methods emerged. In Numbers and Operations topic, the problematic areas were found to be confusion between the capital letter “E” and number “3”, counting down from 9 to 5, teaching of zero, and teaching of two digit numbers. It was highlighted that geometric models and 10's series of accounting blocks are needed. Moreover, the concepts of whole, half, and quarter require models. Similarly, it was found that it is difficult to achieve some attainments. As the results revealed, as far as the attainments “Students will be able to notice...” are concerned, it is difficult to make students notice without explaining the topic. Playing games, drama and musical-rhythmic intelligence were listed as the effective methods in teaching mathematics subjects.

#### Anahtar Kelimeler

ilkokul  
1. sınıf  
matematik öğretim programı  
köy okulları

#### Keywords

primary school  
1st grade  
mathematics curriculum  
village schools

## 1. Introduction

Three constituents of education, namely student, teacher, and curriculum are in interaction with each other. If one of them is insufficient, this could affect the whole system (Ornstein & Hunkins, 1998). According to Karagözoğlu (1987), teachers have the power of affecting curricula through curriculum implementation, and also through the organization and management of the learning-teaching process. As the implementers of curricula, teachers generally have different beliefs and values compared to the curriculum developers (Kennedy, 2005). Fullan and Pomfret (1977) underline the importance of teachers as the most important components of the educational system. Their perceptions of curricula and qualifications to implement the requirements of curricula affect curriculum implementations (Fullan & Pomfret, 1977). In the same vein, teachers have a major effect on students' achievement (Sanders, Wright, & Horn, 1997). Implementing a curriculum after a revision or reform affects both teachers' and students' motivations. Teachers' own personal needs, students' motivation to participate in the activities and practice, and momentum of covering lessons affect the learning-teaching process, which is one of the most important components of the curricula (Kennedy, 2005, p.183). Besides the teacher, students, and curricula, context also has an important effect on success. In order to improve students' learning and so their academic achievement, school and the district where school is located can be evaluated with the help of teachers (NEA, 2011). The context affects both teachers' and students' feelings and practice. Teachers' thoughts, plans and the decision making processes constitute the main part of psychological context. Physical context is in general related to materials, opportunities, and the infrastructure of schools (Clark & Peterson, 1986).

In rural areas, students are in need of feeling confident, and they want to have no concerns about the future and be satisfied with their lives (Ali & Saunders, 2009). From teachers' point of view, positive aspects of working in rural areas are positive interpersonal connections and satisfaction with rural life style (Collins, 1999). On the other hand, social, cultural and professional isolation, inadequate housing, and being a teacher in a compound classroom are the limitations of being a teacher in rural areas (McClure, Redfield, & Hammer, 2003). Compound classroom teachers highlight the importance of waiting for equal outputs from all students no matter where they live and what materials or stimulus they have. Curriculum development team is strongly suggested to take into account rural areas and the limitations of them (Temli-Durmuş, 2015). Hudson and Hudson (2008) suggest offering courses specific to rural areas in pre-service teacher training years. Attitudinal changes towards rural areas can be achieved during training years. Letting pre-service teachers have experience in rural areas during "teaching experience courses" may help change their negative attitudes into positive. Before assigning teachers to rural areas, they can encounter rural conditions as a working area (Hudson and Hudson, 2008).

Providing the fundamental requirements of an educational reform is the handicapped sides of rural schools (Bauch, 2009). In Turkey, after 2005, construction of knowledge has been much more highlighted and constructivism was determined as the main philosophy (Şahin, 2010). Getting low scores in international exams, low mathematics achievement in national central exams, not answering mathematics questions at all in the exams lead researchers to question the efficiency of the Mathematics curriculum in all grades (Doğan & Barış, 2010).

Failure in national and international exams may result from students' anxiety and negative attitude toward Mathematics. The effect of family and friends in eliminating these feelings has been ignored, and it is believed that teachers have the major role in this regard. The attitude and practices of teachers affect student achievement (Alkan, 2010). Moreover, teachers' knowledge about mathematics content, innovative pedagogical practices and personal theories about learning and teaching affect how they implement the program (Manouchehri & Goodman, 2010). Indeed, teachers' instruction and students' achievement are affected by students' thinking on a specific content area (Carpenter et al., 1989). Previous knowledge of students can affect their future achievements. Schemes in students' mind and conceptual knowledge about a specific domain affect students' achievement in mathematics. For this reason, previously learnt subjects or deficiencies play critical role in students' future mathematics success (Mullis, Dossey, Owen, & Philips, 1991). Thus, early childhood education plays an important role in one's life-long success. How students internalize a mathematical concept accounts for a major part of achievement in Mathematics, and the internalized knowledge and processes result in permanent learning (Kilpatrick, Swafford & Findell, 2001). Grossman, Schoenfeld and Lee (2005, p.216) underline the importance of offering many problems or problem situations in mathematics curriculum. In the past, successful students had to master a considerable amount of mathematical information and then apply it in a problem. Now, successful students struggle to solve and develop mathematical ideas on carefully chosen problems. In contrast to this emphasis, early childhood teachers experience limitations on occupying children's mind with a mathematics problem. They prefer to use direct instruction instead of letting children construct knowledge (Güven, Öztürk, Arslan & Şahin, 2012).

Mathematics is perceived as a boring and difficult course. Teachers' attitudes towards mathematics affect students'

attitudes, and having fun while putting mathematical theories into practice is important (Kasa, 2009; Umay, 1992). Playing is the fundamental need of children and primary school students (Akandere, 2003). Learning mathematics through playing has two essential benefits: Children learn mathematics having fun and playing meets their fundamental needs (Gökbulut & Yücel Yumuşak, 2014). Busbridge and Özçelik (1997) define significant efficacy signs. Selecting appropriate methods is based on students' cognitive development stages, skills, and pre-requisite learning. Tural (2005) added another efficacy characteristic: designing plays and activities appropriate for each subject.

As an instructional method, playing attracts curriculum developers' attention in early childhood curricula (Tural, 2005). Some activities and methods are suggested by different curriculum types. Goodlad (1979) defines different types of curricula; namely, ideological curricula, formal curricula, perceived curricula, operational curricula, and experiential curricula. Operational curricula are related to what is going on in a class hour after hour or day after day. Formal curricula and perceived curricula might be different in teachers' mind. In a similar vein, perceived curricula and operational curricula might be unequal. Teachers may perceive them differently than they are actually intended. As the implementers of a curriculum, teachers' thoughts and physical feasibility and location factors affect operational curricula.

Howley and Gunn (2003) stress the importance of providing a better understanding of rural areas with all their characteristics. As far as research in rural areas is concerned, it can be said that qualitative research methods have advantages because only mean differences or statistical comparisons are limited to explain a reality in rural areas. Discovering the meaning attached to circumstances is more valuable for research findings (Howley & Gunn, 2003). Mathematics Course requires models, materials, and sometimes technological equipment like CDs, projectors, and computer-based learning environments to make the subjects concrete for children in concrete operational stage. Some studies showed that rural schools have limitations to provide some materials such as isometric papers, geometrical models like cubes and rectangular prism. Children living in rural areas may not have enough stimuli in their daily life. Thus, the schemes in their minds and voluntariness to do research might be limited which is not acceptable according to the philosophy of Math curriculum (Temli-Durmuş & Yusufoglu, 2016).

Teachers working in rural areas feel that their conditions and needs are omitted in the central curriculum development process (Anılan, Kılıç & Demir, 2015). Early Childhood Education defined as 3-8 years old process of a human life, was found very important for Mathematics Education. Mathematics constitutes of abstract concepts. Teaching of it to children who have yet to learn reading and writing is crucial for success of prospective adults. This study was conducted with classroom teachers working in villages on implementation of 1<sup>st</sup> grade Mathematics Curriculum. Several research projects illustrate the effect of pre-school education on reading-writing learning (Şimşek, 2011; Parlakyıldız & Yıldızbaş, 2004; Bay, 2008) or 1<sup>st</sup> grade reading and writing studies (Öztürk & Uysal, 2013; Güneş, 2009). However, there are limited studies exploring the implementation of 1<sup>st</sup> grade Mathematics Curriculum in villages or teachers' views on implementations.

### **Aim of the study**

The aim of this study is to determine 1<sup>st</sup> grade Mathematics Curriculum implementations from the viewpoints of classroom teachers working in villages. The common characteristic of the participants is that they are working in villages in Şanlıurfa, a city in the southeast of Turkey.

## **2. Method**

Qualitative research was adopted in order to reach detailed information to understand a case. Defining the characteristics of a population, asking questions based on unclear cases, and defining what goes on in a particular case are among the characteristics of qualitative method (Fraenkel & Wallen, 2003). In this study, qualitative data were collected through a semi-structured interview process in line with the aim of the study.

Snowball sampling was used to reach participants. The reason behind using the snowball sampling method is to reach information-rich teachers who have good examples for study and who are willing to spare time (Patton, 1990).

The definition of "rural areas" is made based on the number of people living in that area. As it may be difficult to reach information as to how many people live in an area, the 1<sup>st</sup> grade classroom teachers who work in the schools defined as "village school" were included in the study.

### **Participants**

The participants of the study were composed of voluntary first grade teachers working in rural areas. In total, 12

classroom teachers working in villages in Şanlıurfa participated in the study. Eight teachers are male and four teachers are female with average teaching experience of two years (mean  $M=2$  years).

### **Instrument**

Literature Review was the first step of developing an interview form. After reviewing the literature, semi-structured interview questions were developed by the author. Then, three classroom teachers who work in villages and who are enrolled in a master course named Educational Policies, Curriculum and Implementations given by the first author met and discussed the interview questions. The interview questions were piloted with one 1<sup>st</sup> grade classroom teacher in Uşak. Based on this piloting, especially prompt questions were revised.

### **Data Collection Procedure**

The interviews were conducted in 2015-2016 spring semester. Interviews lasted minimum 15 and maximum 40 minutes. The second author conducted the interviews.

### **Data Analysis Procedure**

Data were analyzed based on the inductive approach, and content analysis was applied. Key terms were highlighted in the prescribed interview documents. As Caudle (1999) mentions, some irrelevant speech is inevitable in interview data. For example, in this study, difficulties in teaching English because of hand writing and families' effect on learning reading by implementing letter-based reading instead of sound-based reading were mentioned frequently although teaching foreign language or hand writing are not related to the aim of this study. Therefore, irrelevant subjects that emerged during the interviews were ignored although the data collector struggled to prevent the participants from diverging from the topic of the interview.

The interviews were recorded and transcribed. The researcher read the data several times, marked the data related to the topic and determined the key terms that explain the participants' views. Then, the researcher wrote down the main ideas and looked for patterns, categories, and relationships. As the last step, the researcher coded the entries according to the patterns identified and supported them with the direct quotations as suggested by Hatch (2002, as cited in Erdoğan, 2006).

### **Validity and Reliability**

In order to ensure internal validity, triangulation and expert analysis were conducted. Two non-participant classroom teachers working in villages gave feedback and approved the last version of the categories. Two non-participant teachers are also master students. As suggested by Yıldırım and Şimşek (2016), to ensure external validity, purposive sampling was used and participants who work under the same conditions in villages were included in the study. On the other hand, in order to ensure reliability, one assistant professor with 11 years of teaching experience as classroom teacher checked the findings and gave feedback. "Pre-school education" was a code of "66 month-old children". After receiving feedback, it turned into a category. "Other" category was under the second theme. The expert underlined the codes affecting all curricula in the first grade. Therefore, "other" category was listed under the first theme. Additionally, 3 external researcher read the transcribed interviews and discussed on the categories and codes. The three willing participants were the students of the master course given by the first author.

### **Limitations**

Collecting data by using of different methods are very important for validity and reliability of a qualitative study. In order to emerge implementations of a curriculum in real a learning environment, observation is vital. The study aimed at taking 1<sup>st</sup> grade classroom teachers' views on the implementations.

## **3. Findings**

The themes were determined as "Factors affecting the 1<sup>st</sup> grade curricula" and "Factors affecting 1st grade Mathematics Curriculum". Under the first theme, 60-66 month-old children, the effect of pre-service education, physical limitations, and others such as lack of parent support and effective teachers' guides were determined as codes. Under the second theme "Factors affecting 1<sup>st</sup> Grade Mathematics Curriculum", content limitations, attainment limitation, lack of materials and effective methods emerged as codes (Table1).

**Tablo 1. First grade Mathematics Curriculum (N= 12)**

Theme	Categories	Codes	F
1. 1 <sup>st</sup> grade curricula	1.1.60-66 month-old children	1.1.1.Different developmental stages	12
		1.1.2.60 month-old and 76-month old children sharing the same class-room	10
	1.2.Pre-school education	1.2.1. Development of hand muscles	11
		1.2.2. Boredom of children who did not attend pre-schools	8
		1.2.3. Willingness to participate in activities	6
		1.2.4. Compulsory pre-school education	6
		1.2.5. Social adaptation	5
		1.2.6. Self-confidence	3
	1.3.Physical Limitations	1.3.1. Cold classrooms	5
		1.3.2. Schools with one classroom	3
		1.3.3. Desks	3
	1.4.Other	1.4.1. Lack of parent support	11
		1.4.2. Effective teachers' guide	7
		1.4.3.In-service teacher training	4
1.4.4.Suggested plays in textbook		2	
2.1 <sup>st</sup> grade Mathematics Curriculum	2.1.Content Limitations	2.1.1.Numbers	
		2.1.1.1.Confusion of number 3 with capital letter E	12
		2.1.1.2.Counting down from 20 to 5	11
		2.1.1.3.Confusion about the writing of 9 and 6	11
		2.1.1.4.Having difficulty in writing 7 and 8	8
		2.1.1.5.Sequence of numbers following 5	8
		2.1.2. Teaching of Zero	10
		2.1.3. Subtraction	6
		2.1.4.Teaching of Time	6
		2.1.5.Teaching of two digit numbers	5
		2.2.1.“Students will be able to read and write numbers”	9
		2.2.2.“Students will be able to count by twos and by fives forward and enumerate down”,	8
		2.2.3.“Students will be able to abstract as a mental process in natural numbers”	6
		2.2.4. “Students will be able to show whole, half and quarter on the model”.	5
		2.2.5.Limited Math Course hours for attainments	4
	2.3.Lack of Materials	2.3.1.10's series of accounting blocs	5
		2.3.2.Geometrical shapes	5
	2.4.Effective Methods	2.4.1. Drama	4
2.4.2. Playing		3	
2.4.3. Use of musical/rhythmic intelligence		2	

### Theme 1: Factors affecting 1st grade curricula

The authors asked about what affects the implementation of 1<sup>st</sup> grade Mathematics Curriculum. The results were listed below and the first theme emerged as factors not only affecting Mathematics Course but also other courses' curricula. 60-66 month-old children, pre-school education, physical limitations, and “Other” that reflect the general characteristics are the categories of the first theme.

#### 1.1. 60-66 Month-old Children

The participants underlined the pressure of teaching to children at different developmental level. Maintaining the learning process is a difficult task for 60-66 month-old children because they need to play games outside and should actually be enrolled in pre-school education institutions according to participants. Participants highlighted the different cognitive, motor, language, and affective development levels in a classroom (n=12). They spare special time for 60 month-old children in a class hour, which they named as “taking away 72 month-old children's time”. For them, 60 month-old and 76-month old children's sharing the same classroom make teachers' task difficult (n=10).

60-66 month-old children play with cars on the desk, cry while drawing lines, and stand up when studying.

Social adaptation is a very difficult task for them. (A male teacher with three months of experience).

### 1.2. The Effect Of Pre-School Education

For almost all teachers in the study, insufficient hand muscle development for writing is a limitation (n=11). Six participants suggested that children younger than 72 months should be enrolled in pre-schools as a part of compulsory education (n=6). Participants perceive pre-school education as a preparation process and the starting point for primary education. One participant interpreted sharing a classroom with different cognitive level as working in a multi-grade (mixed) classroom. Their needs, demands, cognitive levels, reflections, affective and psychomotor developments are different from each other. Therefore, teaching children with various characteristics makes teaching difficult according to the participants. To avoid this situation, pre-school education should be compulsory.

Attainments are very difficult for children who are 60-66 months old. The same situation is valid for children who did not attend a pre-school but older than 66 months. Pre-school education is more important than how old they are. I can say that as a mixed classroom teacher who has 61-86 month-old children in the same classroom, pre-school education should be a must (A male teacher with one year of experience).

We study on drawing lines during the first two weeks. Then, we have to teach sounds. If every student had pre-school education, two weeks would be sufficient. However, we have to teach how to hold a pencil first. While drawing, they are crying and getting tired. So, I cannot follow the content of the curriculum. Teaching of sounds can be delayed (A male classroom teacher with seven months of experience).

Students who attended pre-school education have advanced social adaptation skills (n= 5), and thus, they easily adapt to school life, and they have high self-confidence (n= 3) and willingness to participate in the activities (n= 6), which helps teachers cover the suggested activities in the curricula.

### 1.3. Physical Limitations

Cold classrooms (n= 5), schools with one classroom (n=3), mixed classrooms, and inappropriate desk size for children (n= 3) are the limitations in a village school. Desks are too big for 1<sup>st</sup> grade children. Additionally, the students would like to move around and it is a difficult task for teachers to make them sit on the desk. Temperature of classrooms is very low and students sit wearing their coats. The students who live in border villages come to the schools where the participating teachers work by buses every school day (n= 2). According to the participants, moving students from a border settlement puts an added responsibility on teachers' shoulders. One participant voluntarily offers extra Mathematics and Turkish (reading & writing) courses at the weekend without seeking payment. In this case, some students could not attend and the cognitive level differences limited the teacher.

60-66 month-old children sit on the desk and their feet hang in the air. They cannot write down to their notebooks in this position. We do not have elbow area to move. (A male teacher with three years of experience).

Not only the classroom but also the toilets and the hallway of the school are problematic (A female teacher with seven months of experience).

### 1.4. Other

Lack of parent support (n= 11) is mentioned as the major disappointment. The participants state that parents cannot help their children review what they cover during the school day. They do not support their children's academic achievement because they are illiterate (n= 6).

Another point is that the participants thought teachers' guide book is effective because it offers useful information. The guide is clear and easy to understand (n=7).

Mathematics Course is 5 hours a week. Four participants (n= 4) suggested enhancing Mathematics Course to 8 hours a week. During the first grade of primary education, teachers allocate time for teaching reading and writing and then mathematics. In-service teacher training can provide fun activities to teach mathematics to first graders and concretize the abstract subjects in the curricula. Workshops would be more effective to clearly show the curricula implementations (n=4).

## Theme 2: 1<sup>st</sup> grade Mathematics Curriculum

### 2.1. Content

Confusion of capital letter "E" and number "3" is stressed by all the participants (n= 12). As a solution, they suggest teaching them in different times with a larger time interval, and with the cartoons and creative materials sent by the Ministry of National Education.

Confusion of 6 with 9 in writing ( $n=11$ ), sequence of numbers following 5 ( $n=8$ ), and counting down from 20 to 5 ( $n=11$ ) are the difficult content for students based on the participants' views. Students had difficulty in writing 7 and 8 ( $n=8$ ). In order to write 8, they draw two circles on top of the other.

Teaching of "0" is found problematic by 10 participants. "Absent" term was associated with "0". Participants talked about the past experiences. One participant selects a student and lets him be outside of the class for a while. Then, the students think he will come back, and thus, they get confused.

We draw fruits on a tree or fruits on a plate when teaching subtraction. Students imagine someone ate them or took them away. One of my colleagues brought 5 peanuts, and I gave each of them one by one to a student and while I was doing this, the class started to count down the peanuts in my hand. When there was none in my hand, they couldn't say "0" because they forgot the concept of "0" even if I taught it (A female teacher with three months of experience).

I hesitated about whether I should teach 0 after teaching 9 or I should teach it at the very beginning (A female teacher with three months of experience).

Students count to 5 easily. The order of numbers 6, 7, and 8 are confusing for students. They have difficulty in counting down from 20 and 10 to 5 ( $n=11$ ). Similarly, subtraction is a difficult content that teachers have difficulty teaching.

They count down from 3 to 1 in games, so they can easily learn to count down 3 and even 5. But, the rest is problematic (A female teacher with seven months of experience).

Teaching of time is another difficult content ( $n=6$ ). Morning, afternoon, evening concepts, especially afternoon concept are very nonphysical, and thus, are found hard to learn by students. Teaching of "the top of the hours" is among attainments. It was found unrealistic to teach the top of the hours in the 1<sup>st</sup> grade education in rural areas. Teaching of the subject in 2<sup>nd</sup> grade was suggested. Two digit numbers ( $n=5$ ) were also found difficult to teach. Teachers need help about how it can be taught effectively and permanently.

## 2.2. Attainments

The participants shed light on four attainments: "Students will be able to read and write numbers", "Students will be able to count by twos and by fives forward and enumerate down", "Students will be able to abstract as a mental process in natural numbers" and "Students will be able to show whole, half and quarter on the model". They had difficulty in reaching these four attainments.

The attainments are appropriate for schools located in city centers. Central curricula are forcing us. If I had a computer, I would have a chance to show children cartoons, animations about whole, half, and quarter. I took my computer to school but the computer screen is too small. I need a projector, geometric figures and models (A male teacher with three years of experience)

The participants emphasize their need for help in reaching some attainment like "Students notice that sum does not change when the place of collected numbers is changed" ( $n=2$ ). Two participants tend to explain the mathematics rules implicitly, but the attainment needs to be noticed by students.

## 2.3. Lack of Materials

Mathematics Course needs models, materials, and tools to make the mathematical truths concrete. 10's series of accounting blocks ( $n=5$ ) and geometrical objects ( $n=5$ ) were demanded. Besides, computer, projectors and CDs were demanded.

We do not have enough materials or any models. I tried to prepare them, but it takes too much time. (A male teacher with one year of experience)

Some objects used in daily life can be brought to classes as samples based on their geometric characteristics, or some samples may be sent by the Ministry. Students do not know what a ping pong ball is, or a gift pack is. How can I find or develop a sphere (A female teacher with seven months of experience).

## 2.4. Effective Methods

Participants share their ideas on effective models to be successful in first grade Mathematics Course. Keeping students active is the key point for participants. Drama method ( $n=4$ ) was frequently mentioned to teach addition. Students are willing to play games. Educational games are designed for participants ( $n=3$ ). According to the participants, "to imagine" is very difficult for first grade students. In order to have fun through learning, drama room is demanded by the

participants (n= 2). Although students cannot link a song's music to content, teachers can link and teach (n= 2). Teaching from teachers' side and remembering from students' side are very easy when musical-rhythmic intelligence is used.

Students easily count down in a song but cannot do the same thing without a melody (A male teacher with three years of experience).

I demanded for finger puppets from early childhood teachers. She brought them and by singing a song and using puppets, I taught to count towards 20 (A female teacher with seven months of experience).

#### 4. Discussion

In this study 60-66 month-old children were defined as an obstacle for covering the course content on-time. If all class was composed of 72 month-old children and above, their hand muscles and cognitive level would let teachers realize the attainments in time. Different developmental stages in a classroom were perceived as teaching in a mixed classroom. 60-66 month-old children should be in pre-school according to the participants of the study. The same finding was revealed in Sağlam & Besen's (2015) study as well. 60-66 month-old children's cognitive, affective and psychomotor abilities are limited and pre-school education is seen as a must.

Early childhood education was found essential. The participants demanded that early childhood education must be made obligatory. High social adaptation skills, readiness to reading and writing, and low level school anxiety were emphasized as the advantages. The results showed that if the classes are homogeneous in terms of taking pre-school education, teachers' endeavors will be higher. Similarly, Erkan and Kırca (2010) found in their study that school readiness of children who received pre-school education is higher than the not attended children. They suggest making pre-school education obligatory and also generalizing and making available pre-school education all around Turkey.

The findings of the study show that underdeveloped hand muscles constitute a limitation for classroom teachers. Pre-school can strengthen hand muscles, which is another reason for making pre-school education obligatory. A study conducted by Akbaba Altun, Şimşek Çetin and Bay (2014) proved this opinion as well. Skills that children at early ages have, before starting primary school, were classified as holding a pencil, drawing a line, developed muscle abilities and hand-eye coordination, and it is suggested that the concept of "learning" should be taught when a child is 48-60 months old (Akbaba Altun, Şimşek Çetin & Bay, 2014). The age of children is effective not only in academic achievement but also in social problem solving skills (Yılmaz & Tepeli, 2013).

Physical limitations are found as important obstacles to implement the 1<sup>st</sup> grade curricula in this study. Schools with one classroom, cold classrooms and inappropriate measure of desks were criticized in the study. Similarly, Erdem, Kamacı and Aydemir (2005) found the clouded infrastructure of rural schools as an obstacle. Lack of classrooms in schools, infrastructure of schools, and lack of materials were criticized in their study as well.

The findings of the study showed that as interrelated subjects, counting down and subtraction have limitations. Alptekin (2015) underlined that if a child cannot count down, he cannot subtract. In another study conducted with 48-86 month-old children, the findings showed that success at the "numbers" and "operation" subjects is increasing as the age is higher (Aktaş Arnas, Deretarla Gül & Sığirtmaç, 2003).

Students are not stimulated in daily life in villages. In other words, they do not meet different figures in daily life. Thus, teachers need geometrical shapes and 10's series of accounting blocks. Similarly, in Bozkurt and Şahin's (2013) study almost one of every seven teachers explained that they cannot use materials because they do not exist in schools or they do not have access to materials when they are highly necessary. Another similar emphasis was made in Korkmaz's (2006) study. More materials should be provided, and covering the subjects with visual materials was suggested.

Teaching of two digit numbers was found problematic by the participants. 10's series of accounting blocs are needed to concretize this subject. Dinç-Artut and Tarım's (2006) study revealed that success level of "digit value" is decreasing in higher grades. In this case, it might be said that two digit numbers are difficult to perceive for 60-66 month-old children and older.

Researchers suggest that the materials that are necessary for the 1st grade Mathematics course in rural areas should be determined. Furthermore, observations and experimental studies could be conducted for curriculum implementations. Conducting experimental studies on using different methods and techniques during the lesson in village schools is suggested by the researchers.



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