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Primary School Teachers and Students' Opinions of the First-Grade Mathematics Curriculum in a Turkish Context

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Abstract
This research was carried out to determine the opinions of teachers and students in-depth regarding the primary-school first-grade mathematics curriculum in a Turkish context. This study was designed in accordance with a mixed research method to achieve this goal and to examine the situation that emerged during the implementation of a curriculum. The data collection tools were the "Mathematics Curriculum Evaluation Scale," semi-structured teacher and student interviews, and an observation form. The thoughts of teachers and students regarding the primary school mathematics curriculum were determined in-depth, and the situations that emerged during the implementation of the program were examined. The research population comprised first-grade teachers working in primary schools in central districts of Turkey. Descriptive statistics and content analyses were used for the data analysis. Based on the results, it was concluded that the general structure and objective of the mathematics curriculum were sufficient.

Keywords: Mathematics Curriculum, Curriculum Evaluation, Primary School, First Grade Mathematics Course

1. Introduction

1.1 Introduce the Problem

Mathematics educators point out the importance of mathematical learning based on daily activities that help students manage and make sense of not only school mathematics, but also other areas of their lives (Padilla & Tan, 2019). To understand daily life in a critical and creative manner, students tend to use mathematics and imagine a better world (Atweh & Goos, 2011; Land et al., 2019; Lew, 2019; Wood, 1998). Thus, mathematics lessons take place at every level from primary school to higher education. In primary school, students experience rapid physical, mental, and social development. Thus, the mathematics curriculum should be carefully prepared and implemented for effective mathematics education and to realize the desired levels of learning (Kelley, Hosp & Howell, 2008; Schoenfeld, 2006).

Changes in mathematics curricula occurred worldwide in the 1980s (Christou, Eliophotou-Menon & Philippou, 2004; Senger, 1998; Slavin & Lake, 2008), and the National Council of Teachers of Mathematics (2000) guided reform movements in mathematics education all over the world (Van De Walle, Karp & Bay-Williams, 2010). In this context, local and national reform studies have been initiated in line with research findings, and new research has been done on learning and teaching theories in many countries (Lyakhova, Joubert, Capraro & Capraro, 2019; Kelley, et al., 2008; Schoenfeld, 2006; Steenbrugge & Ryve, 2018).

Some of these reform efforts focus on developing a new curriculum, while others focus on teacher education or mathematics textbooks (Bhatt & Koedel, 2012; Christou, et al., 2004). Boughey (2018) states that the restructuring of the curriculum offers the opportunity to make a real difference in the chances of national and international success for students. Lyakhova et al. (2019) stated that the reason for the reform studies carried out on mathematics courses was the inadequate performance of students on mathematics exams such as the TIMSS and PISA exams.

In the UK, a student-centered approach has been adopted for the mathematics curriculum since the 1960s. With the implementation of a national curriculum in the late 1980s, an approach was adopted in which conceptual learning in mathematics and students' mathematical skills and competencies are developed under the guidance of teachers (Chambers, 2008). In the United States, with the work of the National Mathematics Teachers Association, student-centered approaches and processes that emphasize problem-solving skills have been included in mathematics curricula (Reys, 2014). This is of great importance in terms of informing not only the content but also the learning and teaching methods (Ferreras, Kessel & Kim, 2015; Kilpatrick, 2014; Remillard & Reinke, 2017).

Many countries emphasize curricula that emphasize mathematical modeling, problem-solving, communication, argumentation, and multiple representation skills, especially in recent curriculum studies in the United States and Europe. In addition, emphasis is being placed on infrastructure networks that enable the use of advanced digital technologies and studies that improve the high-level thinking skills of students (Fidel & Oteiza, 2018; Kilpatrick, 2014; Remillard & Reinke, 2017; Reston, 2018; Reys, 2014).

Great importance is attached to education and training policies in Turkey. Especially in recent years, it has been ensured that educational infrastructures are reinterpreted according to scientific and technological changes, and various seminars, in-service training activities, and perspectives have been developed in the context of a continuously updated teaching curriculum (MoNE, 2018). In evaluating the mathematics curriculum, the aim is to provide information about students' understanding of mathematics and their strengths and weaknesses. From this point of view, evaluation of the mathematics curriculum also plays an important role in the defining ways used by students in improving their mathematics learning and expressing how they learn mathematics. The data reveal what goals should be determined for effective mathematics teaching while giving tips about the regulation of effective educational situations at the same time (Yang, Kaiser, König & Blömeke, 2019).

Teachers have the greatest responsibility for the success of the reforms in mathematics curriculum (NCTM, 2000; Senger, 1998; Shuilleabbin & Seery, 2017). In the 2018 curriculum, teachers were expected to pay attention to students' individual differences, learning styles, and strategies, to use concrete materials as much as possible, to make connections with other lessons, and to include games. In addition, the program emphasized that students should internalize mathematical concepts, and new learning should be built on previous learning. The program also emphasized the importance of strengthening the communication skills of students and enabling them to reflect on the thinking process (MoNE, 2018).

In this sense, for the curriculum to be implemented successfully, constant interaction and harmony are required between the written program and the program in practice (Earnest & Amador, 2019). In this study, it was thought to be necessary to meet teachers who are direct practitioners of the program and to obtain information from them about the implementation process. In this context, it is possible for the institutions responsible for program development to take necessary precautions by determining what problems teachers face in practice (Cavanagh, 2006; Spillane & Zeuli, 1999).

There are various studies on the evaluation of mathematics curricula (Bidabadi, Esfahani, Jafari & Abedi, 2019; Clements & Sarama, 2008; Dole, Carmichael, Thiele, Simpson & O'Toole, 2018; Fonger, Stephens, Blanton, Isler, Knuth & Gardiner, 2018; Glencross & Oliver, 1994; Kelley, et al., 2008; Koedel, Li, Polikoff, Hadaway & Wrabeli, 2017; Lyakhova, Joubert, Capraro & Capraro, 2019; Mchugh, 2011; Ma, Lam & Wong, 2006; Norton, Ballinger & Ash, 2016; Valenzuela, 2018; Wheeler & Bray, 2017). For example, Glencross and Oliver (1994) examined the mathematics curriculum for elementary schools in line with the opinions of teachers. They found that teachers think the curriculum is intense, that they need different teaching approaches, and that they want to do their lessons with enriched activities. Similarly Ma, Lam, and Wong (2006) examined the mathematics education programs applied in two primary schools: one in a rural area and one in an urban area. They found that teachers working in the urban area had a tendency to give more difficult math problems to their students since they prepared them for competitions like the National Mathematics Olympics. The study concluded that the beliefs of teachers shape their tendencies and abilities in the adaptation and differentiation of their professional knowledge and skills.

Clements and Sarama (2008) evaluated the effects of a research-based pre-school mathematics curriculum. They found that the math scores of students in the experimental group increased more than in the control group. Bidabadi et al. (2019) carried out a study on a preschool mathematics curriculum and applied a program based on mathematical competencies to an experimental group. They also applied traditional textbooks and teaching based on worksheets in a control group. They concluded that the mathematical competencies improved in students in the experimental group due to the applied mathematics curriculum. Mchugh (2011) evaluated the academic effectiveness of a mathematics curriculum developed with a developmental approach through the Context, Input, Process, Product (CIPP) model. The results suggested that students should be educated in an appropriate class according to their exam scores.

Bhatt and Koedel (2012) compared the effectiveness of three different secondary-school mathematics curricula. They concluded that the traditional programs were used more effectively. Kelley et al. (2008) found that students had low mathematics achievement, the quality of teachers was insufficient, and there was inconsistency between the teaching process and mathematics curriculum. They found that this problem could be solved by curriculum-based evaluation and curriculum-based measurements. Kaur et al. (2018) found that the gap between the formal curriculum and the curriculum implemented should be revealed as a result of studies in which they examined how teachers applied a mathematics curriculum in secondary schools in Singapore.

A limited number of studies have evaluated primary-school mathematics curricula (Cetin, 2010; Dent & Mcchesney, 2016; Kilinc & Anilan, 2019). Cetin (2010) evaluated a primary-school mathematics curriculum based on the opinions of teachers. He found that there were no arrangements that take into account individual learning differences, the program increased the workloads of teachers, the mathematics hours were insufficient, materials were inadequate, and the program was not compatible with crowded class sizes.

Dent and Mcchesney (2016) studied an elementary-school mathematics curriculum and came to the conclusion that field expertise is important in mathematics classes and that the problems experienced in the teaching process can be solved with more professional solutions such as field expertise. Kilinc and Anilan (2019) aimed to determine the opinions of teachers about a primary-school mathematics curriculum and compared them according to determined variables. They found that first-class teachers working in public schools considered the new mathematics curriculum to be positive, but they encountered some difficulties during the application process.

As demonstrated, there are various studies that include different grade levels for the evaluation of mathematics curricula in general. However, there are very few studies on the evaluation of first-grade mathematics curricula in primary schools, and these studies generally focus on the opinions of teachers. Therefore, this study aims to determine the opinions of both teachers and students in relation to a primary-school first-grade mathematics curriculum that has been implemented in Turkey since the 2018-2019 academic year. The results could provide important clues for the implementation and updating of the curriculum. The curriculum has not been evaluated previously, which increases the importance of the study.

It is also important to determine the opinions of teachers and students who are the implementers of the curriculum and the problems that they experience with it, as well as to provide information and suggestions about the program to decision-makers. Based on these facts, the sub-objectives of the research are as follows:
(1) What are the opinions of teachers according to their scores on the Mathematics Curriculum Evaluation Scale (MCES)?
(2) What are the general opinions of teachers about the mathematics curriculum?
(3) What in-class application situations do teachers face in mathematics lessons?
(4) What are the general opinions of students about the mathematics curriculum?

2. Method

This study was designed in accordance with a mixed-research method. The thoughts of teachers and students regarding the primary school mathematics curriculum were determined in-depth, and the situations that emerged during the implementation of the program were examined. To collect quantitative and qualitative data, a descriptive sequential pattern was adopted as one mixed research method. The descriptive sequential pattern method starts with a quantitative stage, followed by a search for special results in the second stage (Creswell & Plano Clark, 2014).

2.1 Population and Sampling

The research population comprised first-grade teachers working in primary schools in central districts of Turkey. For the quantitative part of the research, a cluster sample method was used to select 294 teachers in 40 primary schools. In cluster sampling, groups rather than individuals are randomly selected. All the members of the selected groups have similar characteristics (Mills & Gay, 2019). The regions of the schools where teachers worked were taken as a cluster. Accordingly, teachers working in three regions in low, middle, and high-level socio-economic environments constituted the sample of the study.

The demographic characteristics of the teachers were examined, and 56.8% of them were female, while 43.2% were male teachers. Furthermore, 81% of the teachers had a graduate education, 10.5% had an associate degree, and 8.5% had postgraduate education. In terms of professional experience, 48.3% of the teachers had 21 years or more, 27.9% of them had 16-20 years, 17.3% of them had 11-15 years, and 6.5% of them had 0-10 years. The class size of 47.3% of the teachers was 30 students or fewer, and 52.7% of them had 31 or more students.

The majority of the teachers (83%) had taught the first grade more than four times. The percentages of teachers working at lower (34%), middle (33%), and upper (33%) socioeconomic levels were close to each other in terms of total scores. For the qualitative dimension of the study, nine teachers and 18 students were chosen using the criterion sampling method. The criterion sampling method implies that all cases meet some criterion and is useful for quality assurance. The nine teachers selected met the criteria of having at least 15 years of experience and having taught the first grade at least two times. The qualitative data group consisted of six female and three male teachers. Five of the teachers had a graduate education, two had an MA degree, and the other two had an associate degree.

In the selection of the students, two students from each class (one female and one male) from the classes of the teachers interviewed were included in the study while taking into account their success and gender. Accordingly, 18 students comprising 9 females and 9 males with low and high achievement status were interviewed. In the observation dimension of the study, a teacher with the highest degree (MA) among nine teachers was interviewed within the scope of the qualitative dimension. This teacher was randomly determined, and observations were made in the teacher's classroom.

2.2 Data Collection Tool

The data collection tools were the MCES, semi-structured interviews with teachers and students, and an observation form. The MCES scale consists of 21 items that are rated on a five-point Likert scale. We examined

the construct validity of the scale using an exploratory factor analysis, and the total variance explained by the scale consisting of five sub-factors was 73.965%.

The sub-factors are the general structure, objective (purpose, goal, and acquisition), content (subject to be studied), evaluation, and presentation of the content (visual materials, figure, diagram, and table). It was concluded that the model with 21 items and five sub-factor scales was an acceptable model according to all the fit index values obtained after the confirmatory factor analysis (χ^2/sd= 2.98, GFI= 0.80, AGFI= 0.75, RMSEA= 0.097, RMR= 0.013, SRMR= 0.013, CFI= 0.92, NNFI= 0.91, NFI= 0.90, and PGFI= 0.62). Cronbach's alpha coefficients were used to determine the scale's reliability. The internal consistency coefficient obtained for the entire scale was 0.94.

For the semi-structured interview and observation form, the relevant literature was examined, and interview questions were prepared. For the interview questions, expert opinions were obtained from seven faculty members, including three specialists in classroom education and four in education programs and teaching. Using feedback and suggestions from the expert opinions, the interview questions were rearranged, and the form was finalized by applying a pilot application with a teacher. All these processes were used to test the comprehensibility, content validity, and language validity of the prepared form. In the semi-structured teacher interview form, there are nine questions for the primary-school first-grade mathematics curriculum.

The questions in the semi-structured interview form include questions about the general opinions regarding mathematics curriculum, applicability status, objectives, content, teaching-learning process, and evaluation situations. The interview form prepared for the students consists of three questions related to the general views of the students about the mathematics lesson, the studies carried out in the learning process, and the students' opinions about the assessment process in the classroom.

Six dimensions were determined for the observation form according to the elements of the curriculum. The five-hour pre-application results for the observation form were presented to the opinions of two experts in the field of education programs and one expert in mathematics education, and the observation form was finalized by making corrections. The following dimensions were included in the form: class description, materials, methods/techniques used in lessons, teaching/learning process activities, evaluation activities, and course completion activities.

2.3 Collection of Data

Nine teachers were interviewed to explain the quantitative data and analysis results in more detail. Before the interviews, teachers were given a voluntary participation and asked to read and sign them. The interviews lasted for about 25 to 35 minutes. The interviews with the students took between 5 and 10 minutes. After each interview, audio recordings or notes were entered into a computer and reviewed.

During the interview process, observations were also made for one month (20 lesson hours) in the classroom of a volunteer teacher. The researcher first contacted the teacher and observed only the lessons without taking any notes in the first week. The researcher followed the lessons by sitting in the back row so as not to spoil the naturalness of the environment. In this context, 25 hours of observations were made. However, the observation notes in the classroom started from the second week. For this reason, observation notes were kept in the course of 20 lessons and used in the study.

2.4 Analysis of Data

Quantitative data were analysed using the statistical software package SPSS 22.0. Descriptive statistics were used to evaluate the demographic characteristics of the teachers. To determine whether the data obtained from the scale show a normal distribution, the skewness and kurtosis were calculated as -0.535 and 0.296, respectively. The values were between -1.5 and 1.5, and it was concluded that they fit a normal distribution (Tabachnick & Fidell,

2013). Answers were obtained with a five-point Likert-type scale that was rated as "totally agree" (5-4.20), "agree" (4.19-3.40), "slightly agree" (3.39-2.60) "disagree" (2.59-1.80), and "not at all" (1.79-1.00).

Content analysis was used for the analysis of qualitative data. In the process of coding the interviews and observation data, the compatibility between the two coders was examined and calculated as 0.85, 0.87, and 0.92 (Miles & Huberman, 1994). Teachers were coded as T1 through T9, students were coded as S1 through S18, and classroom observation notes were coded as O1 through O20.

To increase the validity and reliability of the research, some precautions were taken throughout the study. While developing the semi-structured interview form, to increase the internal validity of the research, a conceptual framework related to the subject was established with a related literature review. Based on this conceptual framework, expert opinions were obtained from the interview forms.
During the application of the scale, teachers were interviewed at the second stage and informed about the purpose of the interviews, and mutual trust was established with the volunteers. Approval of the teachers was obtained with a voluntary participation form, in which the purpose of the research was specified in detail. In this way, we tried to reveal the real views of the data collected in the interview process regarding the situations of the participants.

To describe the external validity (transferability) of the study, the process of data collection and analysis is described in detail. The semi-structured interview findings are supported by direct quotations. All the findings are presented directly in accordance with their nature without any comment.

To increase the internal reliability (consistency) of the research, data diversification was attempted when conflicting participant opinions were directly given. A mathematics teacher with an MA degree who took a qualitative research course on the data from the interviews was also asked to encode the sample datasets, and two faculty members who are experienced in qualitative research made examinations. They mutually discussed whether the direct quotations reflected the situation, and they tried to reach a common decision. To increase the external reliability (confirmability) of the research, the researcher explained the operations performed throughout the process in detail. In addition, the raw data were stored by the researcher both digitally and as hard copies so that they could be examined by others.

3. Results

According to the first sub-purpose of the research, the arithmetic mean and standard deviation of the total cores, overall structure, objective, content, presentation of the content, and evaluation subscale of the MCES.

Table 1: Arithmetic mean and standard deviation values of MCES scores of teachers

Dimension	N	$\bar{x}$	Ss
Overall structure	294	3.47	.81
Objective	294	3.44	.76
Content	294	2.97	.83
Presentation of the content	294	3.53	.78
Evaluation	294	2.93	.90
Total	294	3.27	.64

It can be said that the teachers participated in the presentation of content, general structure, and acquisition dimensions of the content of the mathematics curriculum. They were able to apply it and had positive opinions, but they agreed little in terms of content and evaluation and had difficulty in implementation. The overall sum of the MCES was also at the level of "I agree a little."

According to the second sub-purpose of the research, the data from the opinions of the teachers regarding the mathematics curriculum.

Table 2: Frequency distribution of teacher opinions regarding the dimensions of the mathematics curriculum

Theme	Category	Code	F
Objectives	Positive opinions	Open/understandable	9
		Suitable for level of development of students	5
		Achievable	5
		Consistent with each other	5
	Negative opinions	Partially consistent with each other	4
		Not suitable for level of development of students	4
		Realization depends on environmental conditions	3
		Realization depends on equipment of teacher	1
Content	Positive opinions	Can be associated with daily life	6
		Suitable for student level	6
		Suitable for objectives	5
		Balance and integrity in the distribution of units and topics	5
	Negative opinions	No balance and integrity in the distribution of units and topics	4
		Partially suitable for objectives	4
		Partially associated with daily life	3
		Not suitable for student level	3
		No subject repetition	3
		Insufficient in acquiring mathematical skills	1
		More number of units	1
Teaching-learning Process	Activities	Inadequate activities	9
		Some activities are not suitable for environment	1
	Materials	Inadequate materials	8
		Creating materials depends on ability of teacher	6
		Sufficient materials	1
		No materials suitable for level of students	1
	Physical environment	Class sizes are too high	6
		Inadequate classroom lighting	1
	Time	Insufficient time	5
		Sufficient time	4
		Imbalances in distribution of recommended times	3
	Instruction methods and Techniques	Using student-centred methods and techniques	3
		Using teacher-centred methods and techniques	1
Evaluation	Measurement and evaluation materials	Few in number	9
		Insufficient in measuring objectives	6
		Low usefulness	4
		Insufficient in measuring the process	1

The results are divided into themes, categories, and codes. The opinions of the teachers regarding the objective theme can be examined under two categories: positive and negative. When the positive opinions of the teachers regarding the achievements were examined, the achievements were clear and understandable, appropriate to the level of development of the students, achievable, and consistent with each other. However, teachers who had a negative view of the objective dimension stated that the achievements are partially consistent with each other, they are not suitable for the level of development of the students, and their realization depends on the environmental conditions and the teacher.

As a second theme, the views of the teachers on the content dimension of the mathematics curriculum were also collected in two categories: positive and negative. The teachers who gave positive opinions stated that the content could be associated with daily life, it is suitable for the level of the students, and the gains and the distribution of units and subjects are in balance and have integrity. On the other hand, teachers with a negative opinion stated that there is no balance and integrity in the distribution of units and topics, the curriculum is partly suitable for

achievements, it is partly related to daily life, it is not suitable for the student level, and there is no repetition of the subject. In this context, T7 stated, “In terms of balance and integrity in the distribution of units and topics, I think there should be more topics for addition and subtraction.”

As a third theme, the opinions of teachers regarding the learning-teaching process are included in the categories of activities, equipment, physical environment, duration, and teaching methods and techniques. Most of the teachers stated that they thought that the activities and equipment were not sufficient. Regarding this subject, T1 expressed, “We have no geometric shapes. We don't have a board, we don't have math teams.” In the physical environment category, six teachers thought that the class sizes were very high. One of the teachers with this view, T4, said, “There are imbalances between the classes in terms of learning environment.”

Five teachers thought that the duration was insufficient. In this context, teacher T3 expressed, “In terms of time, it is not enough. There is not enough activity to grasp a subject, and there is not enough time for the student to get up to the board and handle the examples on the subject." Finally, in the teaching-methods and techniques category, three of the teachers stated that they used student-centred methods, and one teacher used teacher-based methods. T9 stated, "In terms of methods, we mostly use digital media. Digital platforms offer us opportunities to challenge and develop our creativity. I try to create a student-centred environment by making use of audio-visual and tactile materials besides the book."

As the last theme, the participant teachers stated that the number of measurement-evaluation materials was low, the gains were insufficiently measured, and in the opinions of the teachers, their usefulness was weak, and they were insufficient in measuring the process. T8 said, “Assessment and evaluation materials are not enough. There should be at least five questions about a topic. In other words, a child should see a geometry question from the bottom up, top to bottom, see it from left to right. A question must also be created by the child. The child must create the solution of the problem by himself but by taking advantage of examples….”

Within the scope of the third sub-purpose of the research, in-class application situations for a mathematics course were observed. The following general characteristics of the class were observed. The classroom is approximately 50 m2, looks clean and tidy, and has a tile floor. In the classroom, there are iron railings on the windows, and there is a burgundy background curtain and a blue, green, red spotted curtain on a white background. The walls of the classroom are painted in cream color.

There is a pink cover on the teacher's desk, while the students’ desks have the same color and fabric as the classroom curtain. There is a projector, computer, and sound system in the classroom, and there are two lockers. There are panels that are prepared for different purposes in various parts of the classroom. Students generally seem neat and tidy, and it was observed that they all come to school in school uniforms. The researchers observed that the socio-economic levels of the students in the classroom were generally at a medium level.

The class observed consisted of 40 students. The large class size is a negative situation for the curriculum, which supports the active participation of students in the learning process. The teacher provides classroom management and sometimes has difficulty in attracting the attention of all students to the lesson. The observed teacher stated, “The classroom has 40 people. There is humming. The teacher has difficulty in mastering the classroom and getting the class to do whatever he wants…" (Observation Note: O1).
This situation is reflected in the students as well, and the students complained that they could not speak much. An observed student asked, "Teacher, have you never given me a voice in this lesson?” (Observation Note: O7). There were students at different levels with different comprehension and comprehension rates. When some students have difficulty in grasping the subject, the teacher repeats the subject and goes to the students who have difficulty understanding it, while other students talk to each other or deal with those around them.

Although the teacher occasionally warns them, this situation tends to continue due to the high class size. In this context, the researchers observed, “It was seen that the students who finished the activity quickly turned to other places and talked to each other. The teacher warned these students, but the students continue to talk among themselves” (Observation Note: O3).

On the other hand, a positive psychological environment was observed in the classroom. The students seem very enthusiastic in the lesson, and the teacher has a stimulating role for the students. The teacher seems very sensitive and uses an approach that takes into account the students' interests, wishes, and needs account. In addition, the majority of the students seem happy and excited in the math class. In this context, the researchers observed, “The teacher attends the lesson very graciously. It sounds cheerful and lively. It was observed that the students also came to the lesson ready. All of them have their notebook and pen on the desk. " (Observation Note: O2).

In addition, the teacher uses a language that encourages communication with the students, encourages the students to participate in the lesson, and occasionally uses non-verbal communication. When the teacher starts the lesson in the observed classroom, she generally tends to remind students of the previous day and tries to explain what the subject will be dealing with, to come to the class with the appropriate material within the scope of the lesson, and to inform the students about the objectives of the lesson. In this context, the observed teacher emphasized, “Children will learn to read a calendar today. You know, they took your photos in kindergarten. There was something under those photos. Anybody remember? … Yes, there was a calendar under those photos. Today, we will learn how we read a calendar and how we look at the date from a calendar.” (Observation Note: O15).

In the observed classroom, the teacher came prepared for the lesson by paying attention to the working order in the textbook and the curriculum in the mathematics lesson, prepared a daily plan, adhered to the target and the subject, and also included different activities that were not in the textbook in the learning process. In addition, it was observed that students enjoyed drawing, painting, and cutting and pasting activities in the classroom, which each student focused on: “The teacher distributed coloured worksheets about money to students. The students cut out the money from this paper around their cutting points, pasted them into their notebooks, and pasted numbers that showed how many lira they were equal to” (Observation Note: O14).

It is seen that the students always keep their own tools and equipment (textbooks, notebooks, pencils, erasers, play dough, counting sticks, etc.). In addition, it was observed that the teacher used mathematical materials created by herself in the classroom, and there were materials belonging to mathematics lessons and other lessons in various parts of the class. This situation was observed to increase the active participation of the students in the lesson during the learning-teaching process. In line with the understanding of the curriculum, this situation facilitated mental transitions from concrete to abstract in concept development, supported the development of students’ mathematical process, affective, and psychomotor skills, and increased students' active participation in the lesson in the learning-teaching process. In this context, researchers noted, “The teacher came to the classroom today with the material she prepared to teach the addition process to the students. She hung the material in front of the class board… She first explained how the material was used." (Observation Note: O2).

When we look at the technological possibilities of the classroom, there is a computer, sound system, and projection device in the classroom. The teacher tries to use these technological opportunities effectively. From time to time, the teacher shows videos appropriate to the subject, plays songs, and shows presentations. In these cases, it was observed that students were more interested in the lesson. In this context, the researchers noted, "The teacher came to the class with his computer. While he was connecting the computer to the projector, he reminded his students what they did in the lesson last week. He opened a presentation on the concept of whole-half in fractions.” (Observation Note: O13).

The teacher constantly takes advantage of daily life while processing the subjects and tries to embody them. Concretization of the subject in accordance with the development age of the students is also suitable for the understanding of the teaching program. In addition, it was observed that the students were more eager, interested, and active to participate in the lesson in this way. In this context, researchers noted, “The subject of money is covered. Each student brought an item from home. A doll, toy car, umbrella, ball, tablet… The teacher set up a market in the classroom. She wrote the prices on the items… There is magnetic money on the panel next to the writing board. The students come to the market place by taking the floor and specifying which product to buy. Then, by looking at the price on it, they remove the magnetized money on the side panel, give it to the teacher, and purchase the item… We will do lots of shopping today” (Observation Note: O9).

In the observed classroom, it was seen that the teacher constantly wandered the rows to check what was learned, examined what the students did, verbally reinforced the students who did the correct things, and corrected the mistakes of students who made them. “The teacher noted down the students with missing learning on her agenda and said she would check them on Monday” (Observation Note: O7).

It was also observed that the teacher used worksheets composed of open-ended questions that he prepared mostly as a measuring tool in the classroom where the teacher was observed and used the textbook very little during this process. In this context, the researchers noted, “The teacher preferred to use an activity paper on the subject as a measurement tool.” (Observation Note: O1).

Finally, when we look at the teacher's end-of-course activities, the teacher repeats the topic covered in the last five minutes and summarizes it. The teacher also talks about what will be done tomorrow. However, he cannot do this in every lesson, and when he comes to this part, the exit bell usually rings. In this context, the teacher observed said, "The children can go to recess. We will continue in the next lesson." (Observation Note: O4).

The researchers also observed that the students also had problems regarding the duration. In this context, the researchers noted, "It was observed that some students did not go to recess of their own accord so they could finish the activities, even though the recess bell was ringing and the teacher said that they could go to the recess." (Observation Note: O12).

Table 3: Frequency distribution of students’ opinions regarding the dimensions of the mathematics curriculum

Theme	Category	Code	F
General opinion	Cognitive	Addition-subtraction learning	12
		Learning to count numbers	8
		Problem-solving	8
		Learning time	5
		Learning money	3
		Learning fraction (half-whole)	2
	Affective	Happy	14
		Excited	5
		Bored	1
	Associating with daily life	Using in shopping	7
		Knowing time	3
		Using while playing	2
Teaching-learning Process	Activities	Drawing and painting activities	10
		Cut-and-paste activities	9
		Addition and subtraction operations	4
		Doing counting exercises	3
		Setting up a market and shopping in the classroom	2
		Problem-solving	1
Evaluation	Feedback	Teacher checking homework	13
		The teacher looks at the student's gestures	2
		Teacher not checking homework	2
Problems	Teacher oriented	Writing a lot in the lesson	4
		The inability of students to actively participate in the class	2
		Inability of the teacher to take care of one on one	1
		Too much homework	1
	Content oriented	Having trouble learning the concept of time	4

The results of the interviews with the students for the fourth and last sub-purpose of the study are shown in Table 3. Accordingly, the interview data with the students fall under five main themes: general opinion, teaching-learning process, evaluation, problems, and suggestions. Accordingly, students in the cognitive category of the general opinion theme mostly learned that they learned addition and subtraction, counting, and problem solving. In the affective category, they stated that they were happy and excited in the lesson, and in the category of associating with daily life, they used the content for shopping in daily life. In this context, the student coded S5 stated, "... we learned to add first. Then we learned to subtract. I knew some addition. The teacher was asking us about it. I am not very happy because I answered quickly."

In the activity category of the learning-teaching theme, students stated that they mostly performed activities for drawing and painting, cutting and pasting, and adding and subtracting. In this context, student S11 explained, "We are painting in the mathematics lesson. Our teacher gives points. We paint and glue them." In the feedback correction category of the evaluation theme, the students stated that the teacher mostly checked their homework. In this context, student S12 stated, "We finish the homework, and we show it to the teacher. The teacher looks at it and sees if we did it wrongly or did we do it right?"

In the theme of problems, students stated that they encountered some problems regarding the teacher, content, and activity. Accordingly, regarding the teacher, the students mostly wrote that they could not participate in the lesson actively. They stated that they had problems in learning the concept of time for content. In this context, student S4 stated, "For example, 'what are you doing at nine o'clock?' 'What are you doing at ten o'clock?' He was asking questions like that. I have a little difficulty answering these."

In the last theme, suggestions, the students mostly made suggestions about increasing the number of activities that are interesting and suitable for the level. In this direction, student S5 stated, "We are doing subtraction in mathematics. I think more subtraction should be done. Addition operations should be both colourful and puzzle-like." Regarding the course materials that can be used in the classroom, student S2 stated, "If there were a television in the classroom, I would like to connect to the internet and watch videos about mathematics."

4. Discussion

This research was carried out to determine the opinions of teachers and students in-depth regarding the primary-school first-grade mathematics curriculum that has been used. In this context, it was first concluded that the teachers participated in the items in the mathematics curriculum scale at an intermediate level. This result shows similarity to other studies (Aslan, 2016; Cetin, 2010). It was concluded that the opinions of the teachers regarding the "objective" dimension of the mathematics curriculum are positive. This result overlaps with the interviews and observation results.

When similar studies are examined, it is seen that the opinions of the teachers about the achievements dimension of the programs are compatible with the findings of the study (Al-Shanawani, 2019; Aslan, 2016). On the other hand, it was also concluded that the opinions of the teachers regarding the content dimension of the program are at a medium level. This result is similar to the results of the interviews with teachers. The teachers stated that the content could be associated with daily life, it is suitable for the student level and objective, and there is balance and integrity in the distribution of units and topics.
In the student dimension, it was concluded that the subjects included in the mathematics lesson were learned and can be associated with daily life. Conclusions similar to this finding were achieved through classroom observations. These findings are similar to one of the general objectives of the 2018 mathematics curriculum (MoNE, 2018), which states that the curriculum should be arranged in a way that students can understand and use it in daily life. Again, studies supporting these findings can be seen in the related literature (Al-Shanawani, 2019; Valenzuela 2018).

Another important finding is that the teachers had more negative views about the learning-teaching process. Most of the teachers think that the activities are insufficient. Similarly, the students who participated in the study emphasized that the number of activities was low, and the activity levels were not suitable for their success levels.

Furthermore, in the classroom, it was observed that teachers frequently use additional activities in the process. In this sense, it can be said that the current activities are inadequate for students to comprehend the subject effectively, and there is also a lack of tools and materials in schools.

This finding is similar to those of other studies (Fuentes & Ma, 2018; Glencross & Oliver, 1994; Kelley, et al., 2008; Kose, 2011; Ocak & Tepe, 2019; Temli Durmus, 2016; Koedel et al., 2017). Fuentes and Ma (2018) also showed that teachers should be encouraged in the context of using and evaluating the educational features of the materials used in the mathematics education program to use them more effectively in the classroom. As a result of studies on the effect of mathematics education programs on student achievement, Koedel et al. (2017) reached the conclusion that the use of materials in future research may vary according to the grade level.

According to the qualitative findings of the research, teachers stated that the classes were too crowded for the physical environment. Students stated that they could not actively participate in the lesson because of the crowded class, and teachers could not take care of themselves one-on-one. This result overlaps with the observational findings. In this context, it was revealed that there were students with different learning speeds in the observed classroom, and the teacher was interested in the students who could not learn, while the interest of other students in the lesson decreased, and they spoke among themselves.

It can be said that this situation was caused by the difficulty of the teacher dominating in the classroom depending on the size of the class. In this context, Finn and Achilles (1999) also emphasized that there is a positive relationship between a low number of students in primary grades and the increase in student success. In the same context, Ocak and Tepe (2019) found that there were many problems due to crowded classes.

Besides the physical characteristics of the classroom, a positive climate in the classroom is also important for creating an effective learning environment. It is clear that there is a positive classroom climate with easy communication. It can be said that this situation positively reflects on students during the implementation phase of the curriculum. Hidiroglu (2016) found similar to the results to this study and concluded that academic success increased in a learning environment where students easily communicate with each other and with their teachers.

According to the qualitative findings, teachers had insufficient mathematics lessons, and there are imbalances in the distribution of the time allocated to them. According to the observations and interview results, there were problems in the completion of the activities. Cetin (2010) also reached similar results. In addition, the interviews with teachers clearly show that the time is not sufficient for students to complete activities. This situation coincides with the results of the classroom observations. These results are similar to those of Kose (2011), who revealed that there was insufficient time for the activities in lessons and that there was a shortage of materials and equipment. Furthermore, Altintas and Gorgen (2014) compared Turkey and South Korea's Mathematics curriculum at the primary school level. They found that Turkey is much more time left, and the status of South Korean students a better basic mathematics.

In the qualitative findings of the research, most of the teachers stated that they used student-centred methods and techniques in the teaching-learning process. It was also observed that the teacher tried to ensure the active participation of the students in the observed classroom. This indicates that teachers internalize a student-centred process in accordance with the constructivist approach and program. In this context, Kalem and Fer (2003) concluded that expectations of students towards the lessons were more positive in lessons taught according to active learning principles in which the students were at the centre.

The observation and interview data showed that the evaluation dimension of the mathematics curriculum in practice was especially insufficient for teachers in terms of the basic gains it aimed to measure. From this point of view, it is clear that the majority of the teachers participating in the study have negative views on the evaluation dimension of the mathematics curriculum, and they emphasize that the measurement tools do not measure the achievements. The number of measurement tools is insufficient, and they do not serve their purpose. In this context, the Kilinc and Anilan (2019) looked at the size of the program evaluation studies conducted in Turkey and reached the conclusion that teachers emphasize that they the desired more qualification. In comparative

research, Cetinbag (2019) found that in the assessment dimension of the Canadian mathematics curriculum, different types of assessment are offered to teachers in a way that suits each acquisition. In the assessment dimension of the Turkey mathematics curriculum, different types of assessment are not offered to teachers in a way that suits each acquisition.

To sum up, the evaluation dimension of the new mathematics curriculum has been simplified in comparison to previous programs. Nevertheless, it is clear that it is insufficient to measure what is learned, it is not useful, and problems related to measurement and evaluation continue. Similarly, Demir, Tananis, and Basbogaoglu (2018) and Letina (2015) also found that teachers experienced the most problems in terms of time and lack of guidance during the implementation of alternative assessment and evaluation methods.

On the other hand, teachers in the study stated that creating mathematical tools and materials depends on the teacher's equipment. This finding also coincides with the observation results. For example, in the classroom observed, the teacher used materials that he made in teaching addition with natural numbers, teaching the concept of time, and teaching the subject of money. In this sense, although teachers find the course materials in the new curriculum insufficient, they try to complete the material's deficiencies individually. In this respect, besides providing ready-made materials to schools, guiding and encouraging activities for teachers in preparing materials can be effective in increasing the quality of learning environments.

Finally, compared with other countries engaged in similar programs, the reformed mathematics curriculum implemented in Turkey has similar efficacy. However, it was concluded that the expected goals in the learning-teaching process and assessment dimensions were not achieved. It is thought that the implementation of the curriculum could be improved by curriculum development experts revising the weak elements of the curriculum, especially in the dimensions of learning, teaching, and evaluation.

From this point of view, within the scope of curriculum development, many researchers emphasize that it is important to compare the educational practices and curricula of different countries during the development of a curriculum and to determine the deficiencies of the programs in this context (Baki & Gökcek, 2005; Cetinbag, 2019; Hıdıroglu, 2016). In this sense, examination of the current mathematics curriculum will not only provide information about the program's image, but also contribute to the future experience of other countries with similar characteristics.

4. Suggestions

According to the results of this study, it is suggested that the number of activities and measurement and evaluation tools be increased in the teaching and learning process. It may be suggested that the physical facilities of schools be reorganized according to the changing and developing educational understanding, to provide in-class technological facilities that will facilitate the active participation of students in lessons and structuring the information, and to ensure that the necessary materials for students and teachers are made available in learning environments for mathematics lessons.

The research findings were obtained through processes limited to students and teachers based on both quantitative and qualitative data. The similarities and differences between the renewed primary education curriculum and the primary education curriculum implemented in developed countries could be compared. This research was evaluated from the perspective of primary-school teachers and students in mathematics only. Thus, research could be conducted to include the opinions of parents or administrators.

After presenting the results, you are in a position to evaluate and interpret their implications, especially with respect to your original hypotheses. Here you will examine, interpret, and qualify the results and draw inferences and conclusions from them. Emphasize any theoretical or practical consequences of the results. (When the discussion is relatively brief and straightforward, some authors prefer to combine it with the Results section, creating a section called Results and Discussion).

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