

## **Experience of Primary School Teachers With Inclusion Students in the Context of Teaching Mathematics: A Case Study\***

**Mehmet Emin Durmuş<sup>i</sup>**  
Ministry of National Education

**Yusuf Ergen<sup>ii</sup>**  
Kahramanmaraş Sütçü İmam University

### **Abstract**

This study investigated experiences of primary school teachers with inclusion students in the context of teaching mathematics. In the study the phenomenology design, which is one of the qualitative research designs, was used. The participants were determined by criterion-based sampling method. The participants of the study consisted of 21 primary school teachers with inclusion students. Research data were collected by a semi-structured interview form developed by the researchers. Content analysis method was used for data analysis. The study found that the participants mostly used rough evaluation forms in order to determine the gains when preparing IEP. In addition, most of the participants stated that they needed help in preparing IEP and they received the most of the help from school counselors. The participants stated that they mostly used demonstration, teaching with play and drama methods and that they could practice with inclusion students only during breaks, during social activities times or in the hours in the support training room apart from mathematic class. Moreover, it was found that most of the participants measured verbally gains of the inclusion students by question and answer method. It was also concluded that inadequacy of the time was the most common problem they encountered in the process of learning-teaching and assessment for the mathematics class.

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<sup>i</sup> **Mehmet Emin Durmuş**, Primary School Teaching, Ministry of National Education, ORCID: 0000-0003-4541-3047

<sup>ii</sup> **Yusuf Ergen**, Assist. Prof. Dr., Department of Primary Education, Kahramanmaraş Sütçü İmam University, ORCID: 0000-0003-4313-5354

**Correspondence:** yergen22@gmail.com

## INTRODUCTION

Mathematics is a skill that takes place in every aspect of life. All people need mathematics regardless of having a specific reason for learning it. In Turkey some students with special needs study in general education classes as inclusion students based on the idea of “least restrictive environment.” Inclusion students’ acquisition of mathematics at a basic level can increase their self-confidence and quality of life, and they can be integrated into the society more quickly. For this reason, it is necessary to determine mathematics needs of inclusion students by all the factors affecting their education and to work for improving them. One of these factors is the teacher. In particular, primary school teachers are the ones with whom the inclusion students spend the most of their time during education life. They are also next educators whom the inclusion students meet in their education career after the pre-school teachers. It is considered that the experiences of primary school teachers with inclusion students in teaching mathematics will shed light on their colleagues and researchers.

### Inclusive Education Applications

According to Bryant, Smith & Bryant (2019), one of the basic principles of special education is that children with special needs should receive education in the least restrictive environments. The least restrictive environments allow children with special needs to spend as much time as possible with their peers and in these environments, students can achieve high levels of success (Kargin, 2004; Batu & Kircaali-Iftar, 2011). According to Eripek (2007), the least restrictive environments are the general education classes that provide necessary arrangements according to the needs of children with special needs, and it is aimed that the children integrate not only physically but also socially and educationally.

In Turkey, educational requirements of children with special needs are met in special education classes, special education schools, homeschooling, education in hospitals and inclusive education (Ministry of Education [MEB], 2017). However, due to the limited number of special education classes and support education rooms, inclusive education is more preferred for the education of the students with special needs (Yılmaz & Batu, 2016). Inclusive education practices refer to the education provided for students with special needs in special education classes with their peers full-time or part-time in order to ensure that individuals with special educational needs interact with other individuals at all categories and levels and achieve their educational goals at the highest level. (Özel Eğitim Hizmetleri Yönetmeliği [ÖEHY], 2018).

**Full-time inclusive education** is the inclusive education that students with special needs register in general education classroom and they get all of the classes taught in general that classroom. In this education, students with special needs follow the education program in the general education classroom in which they are registered. And based on the program they follow; an individual education plan is prepared according to their individual needs. (MEB, 2010). The maximum number of students with special needs can registered in general education classroom where full-time inclusive education is applied is listed in the table below.

**Table 1.** Maximum Number of Students with Special Needs Can Register in Full-Time Inclusive Education Classes

The number of students with special needs	Number of students in school levels	
	Preschool classroom	Other levels
1	20	35
2	10	25

Note: MEB, (2015)

As Table 1 shows, there should be maximum of 20 students in preschool classroom and 35 students in the other school levels if there is one student with special needs. In classes with 2 students with special needs, there should be maximum of 10 students at a preschool classroom and 25 students at other levels.

**In part-time inclusive education**, student with special needs register in a special education class and the student attends to general education class during the courses that the student can be successful (Battal, 2007). Such application allows the student with special needs to mostly develop herself socially (Batu & Kırcaali-Iftar, 2011). In this application, maximum of two students in the special education classroom can be included to general education classroom (MEB, 2010).

The related literature (Diken & Sucuoglu, 1999; Eripek, 2004; Özak & Diken, 2010) shows that inclusive education practices have become widespread in education system over time. According to Ministry of Education statistics (2019) the number of inclusion students studying in primary schools was 115.556 in Turkey. This data indicates that teachers should be ready for students with special needs.

### **Teaching Mathematics in Primary School in the Context of Inclusion Students**

The study titled *Principles and Standards for School Mathematics* (2000) published by the National Council of Teachers of Mathematics emphasizes that every student can and should learn mathematics. In primary school mathematics program, it has indicated that individual differences of students should not be ignored. It was also stated that applications which emphasize the learning styles and strategies of students should be included in teaching mathematics (MEB, 2018).

According to Kırcaali-Iftar, Ergenekon & Uysal (2008), it is important to acquire skills that will help individuals who have weaker development characteristics compared to their peers in terms of their daily life activities. It is also significant to prepare these individuals for independent life. Spending money, knowing what the time is, making four basic operations, and etc. skills and reading and writing skills in regular daily issues are defined as functional academic skills. Teaching functional academic skills has gained importance with the inclusion of more students in general education with inclusive applications (Erbaş, 2008). In the related literature, there are many researches that different teaching methods were applied in order to help inclusion students gain daily life skills. Cybriwsky & Schuster (1990), Kırcaali-Iftar et al. (2008), Morton & Flaynt (1977) and Yıkmış & Çetin (2010) examined the constant time delay teaching method; Eliçin, Dagseven Emecen & Demolished (2013) and Kroesbergen & Van Luit (2005) examined the direct instruction method; Everett (2017) explored the music method; Fletcher, Boon & Cihak (2010) studied the touch math method; Karabulut & Yıkmış (2010) studied the simultaneous prompting method; Skibo, Mims & Spooner (2011) explored most-to-least prompting method; Tuncer (1994) and Sinoplu (2009) examined cascaded teaching method; Demolished, Tekinarskan & Pınar (2005) investigated the effects of the stepped teaching method and Wisniewski & Smith (2002) focused on the math skills of students with special needs. The researchers stated that they obtained positive results from the methods they applied. Although there are several studies in the literature that examine the methods of teaching mathematics to students with special needs, there are not enough studies that examine teachers' experiences in the context of teaching mathematics. For this reason, it is considered that the current study will contribute to the literature in terms of examining teacher experiences.

It is important for teachers to support students who have problems in learning mathematics in the areas they need, to plan teaching in a way that meets their individual needs, and to make the necessary adaptations for their development of mathematics skills. (Fabric & Ergül, 2017). For this reason, it is significant to reveal in what areas primary school teachers have problems in the context of teaching mathematics in inclusive education and how they solve these problems or why they cannot solve them. Thus, it is considered that the results of the research will contribute to the preparation of more qualified educational environments for students. In this study, it was aimed to determine the

experiences of primary school teachers with inclusion students in the context of teaching mathematics and to make recommendations to researchers and primary school teachers within the scope of these experiences.

## METHOD

### Research Model

The current study was prepared in phenomenology pattern, which is one of the qualitative research methods. Phenomenology is the people's conscious experience of life; that is, daily life and social actions (Schram, 2003). Phenomenology aims to highlight the perception and experiences of individuals from their own perspectives (Ersoy, 2016). In case studies, researchers collect data from people who have experience with the case and present a holistic description that defines the essence of the experiences of all individuals (Creswell, 2013). In addition, Van Manen (1990) states that phenomenology is not merely a description, and it is an interpretive process in which the researcher remarks on the meaning of experiences. The process followed in the current research within the context of the phenomenology pattern is presented in Figure 1.

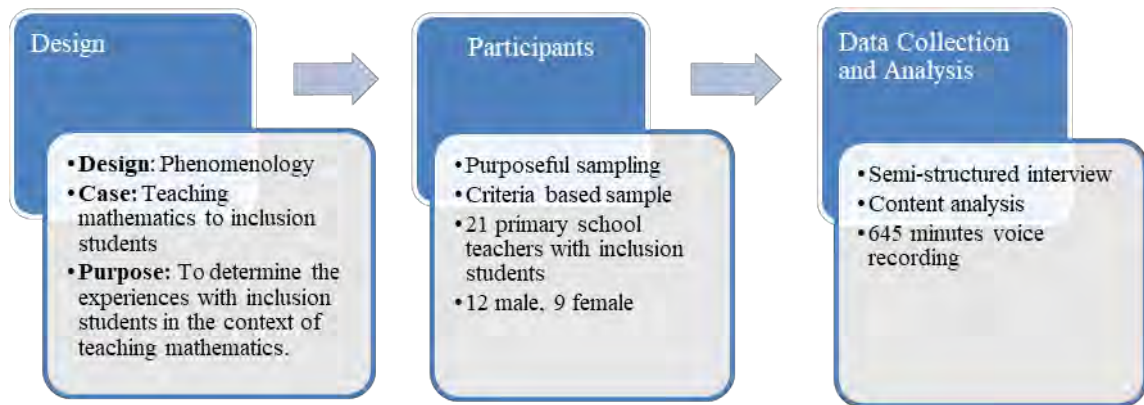


Figure 1. Research Process

### Participants

The participants of the study consisted of 21 primary school teachers who were working at primary schools in which had classrooms with inclusion student/students in the villages, towns and central city of a province in north-east of Turkey in the academic year of 2017-2018. The basic mentality of the criterion-based sampling technique is to study all situations that meet a set of predetermined criteria (Yıldırım & Şimşek, 2006). In determining the participants, the criterion of “having an inclusion student in the classroom of the primary school teacher” was determined.

The real names of the participants were kept secret and the code names appropriate to their gender (Emine, Fatma, Mustafa, etc.) were used. Demographic information of the participants is presented in Table 2.

**Table 2.** Demographic Features of the Primary School Teachers Participating in the Research

Demographic Features of the Participants			
Gender	Male	Emine, Fatma, Rukiye, Bade, Ayla, Elanur, Ayşen Büşra, Dilek	9
	Female	Mustafa, Naim, Bugra, Enes, Murat, Arif, Serdar, Atilla, Vedat, Ahmet, Kadir, Oguz	12
Career	0-5 years	Emine, Rukiye, Oguz	3
	6-10 years	Fatma, Mustafa, Enes, Murat, Arif, Ayla, Elanur, Ayşen, Atilla, Vedat, Ahmet, Dilek	12
	11-15 years	Serdar	1
	16-20 years	Naim, Büşra	2
	20 years or above	Bugra, Bade, Kadir	3
Background in Inclusion Area	Special Education Course	Mustafa, Enes, Bade	3
	In-Service Training	Naim, Ayla, Ayşen, Büşra, Ahmet	5
Years of Experience with Inclusion Students	0-1 year	Emine, Rukiye, Bugra, Arif, Elanur, Ahmet, Oguz, Dilek	8
	1-2 years	Fatma, Enes, Ayşen, Atilla, Kadir	5
	2-3 years	Mustafa, Naim, Murat, Ayla, Vedat	5
	3-4 years	Bade, Serdar, Büşra	3
Number of Students in the classroom	10-20 student		12
	20-30 student		8
	30-35 student		1

As Table 2 shows, 12 of the participants are male and 9 of them are female. All of the participants had undergraduate background and most of them had been teaching for 6-10 years. 3 of the participants received a special training course in the field of inclusive education, 5 of them attended in-service training, and rest of the teachers did not receive any specific training. Considering the duration of the participants' experiences; It was reported that 2 participants had 7 months, 7 participants had 6 months, 1 participant had 1 year 2 months, 4 participants had 1 year 6 months, 5 participants had 2 years 6 months and 2 participants had 3 years 6 months experiences. It was determined that 12 of the participants were teaching in a class with 10-20 students, classrooms of 8 participants consisted of 20-30 students, and 1 teacher was teaching to a class with 30-25 students. In these primary schools, the class size is at most 35 students in general education classrooms with 1 inclusion student and class size is at most 25 students in general education classrooms with 2 mainstream students (MEB, 2015). Therefore, it can be state that class sizes were suitable for inclusive education. In addition, it was reported that the participants with code names of Mustafa, Naim, Bade, Murat, Arif, Serdar, Ayla, Büşra, Vedat and Ahmet were teaching mathematics (1 hour per day) to inclusion students in the support education room (teachers' room) apart from math class.

### Data Collection Tool

In the research, the interview method, which is one of the qualitative research methods, was used and the research data was collected through the semi-structured interview form and voice recorder developed by the researchers. In case studies, data sources are individuals or groups who are able to reflect the phenomenon which the research focuses on, and interviews are conducted in order to reveal experiences related to these cases (Büyüköztürk, Kılıç Çakamak, Akgün, Karadeniz & Demirel, 2016). Interviewing is the primary data collection method in the phenomenon pattern to obtain the basic structure or reality underlying the meaning of the experience (Merriam, 2013; Yıldırım & Şimşek, 2008).

While developing a semi-structured interview form, firstly the relevant literature was reviewed and a conceptual framework was created to ensure internal validity. In order to ensure the scope and structure validity of the interview form, the opinions of 3 academics, 3 school counselors, 3 special education teachers and 4 primary school teachers, who were experts in the field of classroom education were taken. The school counselors, special education teachers and primary school teachers examined the interview form and found the questions of the form as suitable for the purpose of the research, while the academics presented negative feedbacks regarding the scope validity. The

academics stated that some questions aiming to ensure the validity of the scope were out of the scope of the research. As a result of these opinions, the scope was clarified by reducing the number of questions to 3 in the interview form which was previously consisting of 6 questions. By using the form, a pilot application was carried out with 3 primary school teachers who had inclusion students in their classrooms. And it was determined that there was no need to make any changes to the research questions after the pilot implementation. The final form includes three questions given below.

Could you tell us about your preparation for inclusion students in the context of mathematics lesson?

Could you tell us about your course processing for inclusive students in mathematics lesson?

Could you tell us about your evaluation processing for inclusive students in mathematics lesson?

### Collection of Data

While collecting research data, the purpose and importance of the study was shared with the participants and it was stated that the answers would definitely not be used for any other purposes. During the interview, the data were collected by a voice recorder which was used with the permission of the participants, and the researcher took written notes during the important parts. Each interview was held outside the class hours. The location of the interviews, the date of the interviews and the duration of the interviews are given in Table 3.

**Table 3.** Information on Interviews with Teachers Participating in the Research

Participant	Date of Interview	Duration of Interview (Minutes)	Location of interview
Emine	26/03/2018	25	Café
Fatma	29/03/2018	26	Teachers' Room
Mustafa	02/04/2018	20	Teachers' Room
Rukiye	02/04/2018	18	Teachers' Room
Naim	09/04/2018	22	Teachers' Room
Bugra	11/04/2018	26	Teachers' Room
Enes	17/04/2018	17	Teachers' Room
Bade	17/04/2018	26	Teachers' Room
Murat	27/04/2018	20	Teachers' Room
Arif	30/04/2018	17	Teachers' Room
Serdar	02/05/2018	19	Teachers' Room
Ayla	02/05/2018	18	Teachers' Room
Elanur	02/05/2018	21	Teachers' Room
Ayşen	03/05/2018	19	Teachers' Room
Büşra	07/05/2018	32	Teachers' Room
Atilla	08/05/2018	29	Café
Vedat	14/05/2018	32	Teachers' Room
Ahmet	14/05/2018	20	Teachers' Room
Kadir	14/05/2018	17	Teachers' Room
Oguz	14/05/2018	20	Teachers' Room
Dilek	22/05/2018	21	Teachers' Room

As Table 3 shows, the interviews were completed within 2 months. Somedays the interviews were made with 1 participant, somedays with 2 participants, somedays with 3 participants and somedays with 4 participants. The duration of the interviews varies between 17 minutes to 32 minutes. And 21 participants were interviewed within total of 465 minutes. Two participants were interviewed in a cafe and the rest of the participants were interviewed in teachers' room.

## Data Analysis

In the research, content analysis method was used in the analysis of data based on the phenomenal data analysis technique proposed by Moustakas (1994). Ersoy (2016) turn the data analysis process proposed by Moustakas (1994) into a table below.

**Table 4** Phenomenon Data Analysis Process

Stage	Action
Identification of important statements	Firstly, the important statements of the participants regarding the phenomenon are determined. In this process, repetitive and irrelevant expressions are removed.
Grouping of common expressions	All of the common expressions are gathered.
Theming sets of meanings	Common expressions are classified in order to form certain themes.
Creation of structural and textural descriptions	Textural definitions of what the participants experience and structural definitions about how they experience are created.
Combining structural and textural descriptions	The common meaning created by the structural and textural descriptions is derived.

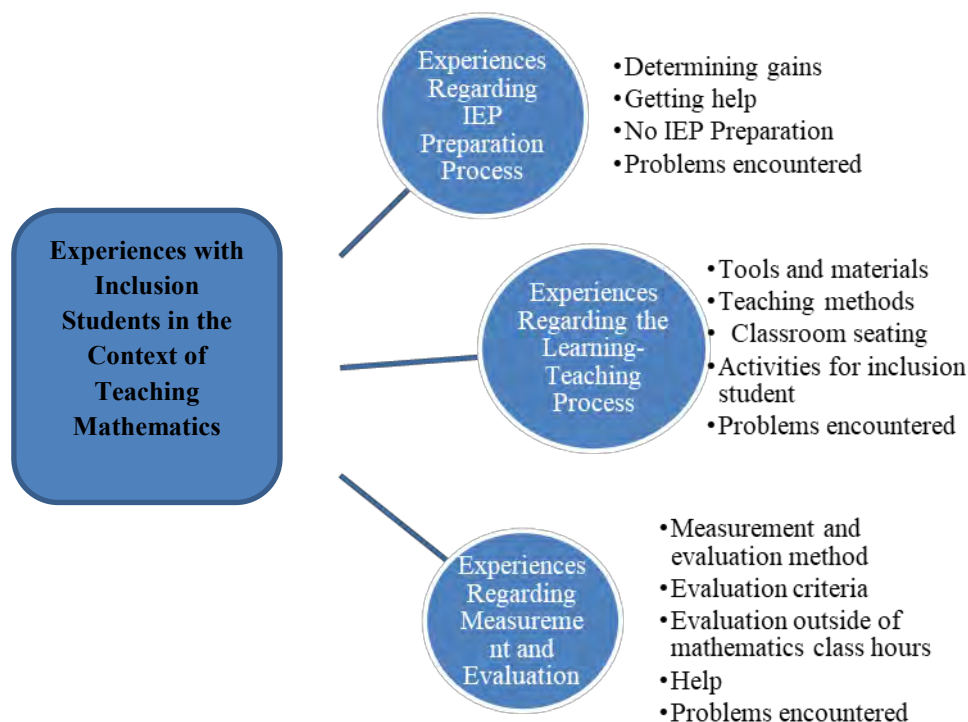
In the content analysis, it is aimed to conceptualize the data and reveal the themes that can describe the phenomenon. The results are presented in a descriptive narrative and direct quotes are often included. In addition, the themes which were revealed and findings about the patterns are explained and interpreted (Yıldırım & Şimşek, 2008). In case studies, it is recommended to examine the individual experiences in depth when the number of participants is low, and to examine the experiences and meanings of the participants in the context of themes when there are many (Ersoy, 2006). In this study, the experiences and meanings of the participants were explained in the context of the themes, the expressions of the majority/some of the participants were used under each theme and the opinions of the participants who expressed different opinions were attempted to be described individually. The data analysis process of the research is as follows:

The voice records of the interviews were transcribed to a text document on computer on the meeting day or next day. After all of the interviews were transcribed, the sections related to the research were saved while sections not related to the case were removed. Then, similar aspects of the answers given by the participants were determined and the common expressions were reached. Then, the cases experienced by the participants and how they experienced these phenomena were described by using the obtained codes, categories, sub-themes and direct quotations within the framework of the main themes. Finally, the common meaning was reached by analyzing the descriptions.

The answers given to the interview questions were reviewed by the researchers several times. Codes were created by the researchers from the sentences and paragraphs in the data and the obtained codes were compared. A consensus has been reached on the codes understood differently. By classifying the codes according to their similar features, categories, sub-themes and themes were obtained.

## FINDINGS

After the interviews with the primary school teachers participating in the research, the experiences of the participants with inclusion students in the context of teaching mathematics were gathered around three themes. The themes reached are presented in Figure 2.



**Figure 2.** Themes Regarding Primary School Teachers' Experiences with Inclusion Students in the Context of Teaching Mathematics

According to Figure 2, the participant' experiences with inclusion students in the context of teaching mathematics were gathered within 3 themes: "Experiences Regarding Individualized Education Plan (IEP) Preparation Process", "Experiences Regarding Learning and Teaching Process" and "Experiences Regarding Measurement and Evaluation."

### **Theme 1. Experiences Regarding IEP Preparation Process**

The first theme reached for determination of the participants' experiences with inclusion students in the context of teaching mathematics was the theme of "Experiences Regarding IEP Preparation Process." The statements of the participants regarding the IEP preparation process were gathered around 4 sub-themes: "determining gains," "getting help," "problems encountered" and "No IEP preparation."

In the research, almost all of the participants stated that they prepared IEP for inclusion students in the context of teaching mathematics and they mostly used rough assessment form while determining the gains, and that they especially care about the acquisitions that inclusion students may need in their daily lives. In this context, the participants stated that they mostly determined the gains related to simple addition and subtraction operations. In addition, the participants stated that they received the most help from school counselors in the process of preparing the IEP. Some participants stated that they also got help from internet resources and school administration. Some examples of participants' opinions are given below.

*First, we made a level determination for the student. And we have some questionnaires that we request from GRC (Guidance Research Center) and we call it rough evaluation. The child has, for example, cognitive and social characteristics. First, we made a preliminary diagnosis to the child, and we already presented it as a report to our school's IEP board (Mr. Vedat).*



*[the student] should know the numbers absolutely, [the student] should make simple addition and subtraction operations. Thus, the student can express himself in daily life, so that he can do his works (Mrs. Bade).*

*I prepare my IEP with the help of the school counselor (Mrs. Elanur).*

*I got help from the internet (Mr. Murat).*

*I just started getting to know the student. I received support from the administration in this sense, I talked to the administration (Mrs. Emine).*

Mr. Atilla, Mr. Kadir, Mrs. Fatma and Mr. Oguz stated that they did not prepare IEP for inclusion students. Participants stated that the following were effective in not preparing the IEP: the fact that the student's diagnostic report was not sent in time by the GRC, that the academic level of the inclusion student was not too low to prepare the IEP based on the doctor's report, and that the IEP was prepared by the teacher providing support education in school. Some examples of participants' opinions are given below.

*We have no IEP. It is because 1 month ago the report reached to us, the report from GRC was just arrived (Mr. Atilla).*

*The doctor said: he can do Turkish, but nothing will happen in mathematics, which means that he will have very very low-level gains in mathematics (Mrs. Fatma).*

*Because this child's level is very low, I wanted him to socialize instead of dealing with mathematics (Mr. Kadir).*

*I have na IEP, but I did not prepare it, it was prepared by teacher who gives support education. I did not get involved (Mr. Oguz).*

In the current study, the participants stated that they mostly encountered the problem of not being able to determine the appropriate gains for the inclusion students during the IEP preparation process. Others stated that they were inexperienced in preparing IEP. Some of the participants stated that they had problems in determining gains because inclusion students have difficulties in expressing themselves. Mr. Bugra, on the other hand, expressed that that the problem he faced was indifference of the parents of the students while preparing IEP. Some examples of participants' opinions are given below.

*Namely; The gains we determine are sometimes not understood by most of the students, so we cannot achieve success. In other words, it seems that we just literally state the gain. We sometimes have problems at that point, so we try to determine gains according to the situation of the child, but still, while they can reach some well, they may not succeed in another ones (Mr. Mustafa).*

*Actually, it is my first time to have an inclusion student. We prepared IEP little bit inexperienced (Mrs. Ayşen).*

*The most difficult was the following; For me, this student is a very unpredicted child. Namely, he is very different, I cannot understand what he learned and what he did not learn. It is like this; he answers when you ask for the first time and cannot answer when you ask for the second time. In other words, he is not stable, I cannot determine the gains. It is because he sometimes does and sometimes cannot do (Mrs. Rukiye).*

## Theme 2. Experiences Regarding the Learning-Teaching Process

The second theme reached in order to determine the participants' experiences for inclusion students in the context of teaching mathematics is "Experiences Regarding the Learning-Teaching Process." The learning-teaching process theme were gathered around 5 sub-themes: "tools and materials", "teaching methods", "classroom seating", "activities for inclusion students" and "problems encountered".

Almost all of the participants stated that while determining the tools and materials they use in the context of teaching mathematics for inclusion students, they take the concrete criterion of the mathematics acquisitions as the basic condition and they provide the materials and materials by themselves. The participants mostly expressed the materials and equipment they used as arranged materials such as beans, decade-hundred blocks, legos and sticks. Only Mrs. Emine and Mr. Ahmet stated that they prepared the materials by themselves for the inclusion students. Rukiye teacher stated that she did not prepare any teaching materials for these students and based this on the discourse of the school administration. Some examples of participants' opinions are given below.

*Rather, the simple things he can hold with his hand can be, like the paperboards he can hold with his hand and see through his eyes, namely the things that he can paint and make. So, the goal is to hold it by hand and see it through the eyes. It must be concrete things. For instance, while teaching numbers small cartons with numbers can be used, these cartoons can be painted or sheared (Mr. Enes).*

*I get them by myself from stationery shop (Mr. Serdar).*

*I use the materials that I have developed, that can be used for both addition and subtraction (Mrs. Emine).*

*I am already against the idea of "let me make materials at home and bring it to the inclusion student" (Mr. Ahmet).*

*I don't have any material right now. They already told me she was only an inclusion student. They said you teach and the child will get as much as she can (Who said? - School administration). I do it accordingly (Mrs. Rukiye).*

Most of the participants stated that while determining the teaching methods they applied for inclusion students in the context of teaching mathematics, they took into account the level of achievement of the inclusion students in mathematics. It has been observed that teaching and demonstration, teaching with play and drama methods are used mostly as teaching methods. Only Mrs. Rukiye stated that she did not apply any teaching method for the inclusion student. She stated that the reason for this situation was having difficulty in determining the level of the student. Some examples of participants' opinions are given below.

*Since it is a face to face education, we use more demonstration method (Mr. Mustafa).*

*Animation, using drama, and in some cases gamification, educational games. Educational games are the most helpful ones at this point we use. It is because the child is normally bored from and fed up the class (Mr. Vedat)."*

*No, I can't say that I have a teaching method in the name of mathematics. I have just start to work here, I cannot recognize [inclusion student]. I still have difficulties getting to know more about [the inclusion student] (Mrs. Rukiye).*

The participants stated that they mostly use the classical layout as a seating arrangement for inclusion students in mathematics class. Most of the participants determined the closest place (front seats) to the teacher for the inclusion students in the classroom. Participants stated that in this way they aimed to provide control of the inclusion student. On the other hand, Mr. Ahmet and Mr. Oguz stated that they do not set a fixed place for inclusion students in order to facilitate the acceptance of them by their peers. Nearly half of the participants wanted them to get help from their peers within the scope of the seating arrangement. Mrs. Bade, on the other hand, stated that peer support is also beneficial for normal students and provides them to learn some values such as benevolence. Some examples of participants' opinions are given below.

*I let students sit two by two as in the classical order. I always ask better students to sit near her to help her when she needs. Since her first year, I endorse on her to be conscientious and helpful. These kids are like a material/tool for me. They are not aware, but my class is clamped over these children, nobody mocks the other one (Mrs. Bade).*

*[the inclusion student is] A bit far from other rows and closer to me. Because she could not adapt very well with his friends, she would be more focus on me, spend time with me, so that I could be more dominant/control. Anyway, when he is alone, there is something like an exclusion, she certainly does not listen me if she sits in backside seat (Mrs. Ayşen).*

*,There is no place where I would definitely make [inclusion student] to sit in, it changes. When I first teach to them, they were separated from their friends because of their level, and their peers did not play with them. They were fighting each other. The reason that I make them sit together is to provide especially in-class harmony. Since I want them to feel that they belong to the class, I make them sit with their peers (Mr. Oguz).*

Almost all of the participants stated that they involved inclusion students in the context of teaching mathematics in games activities and group work in order to integrate them with their peers and develop their self-confidence. Some of the participants stated that they implemented individual activities for inclusion students and that they performed these activities outside the math class, such as support education room, breaks and social activities class. In this context, the participants stated that especially the support education room is useful since it provides teacher to spend necessary time to spend with the inclusion student. Among the participants, only Mr. Kadir stated that he did not make inclusion student to do activities outside of mathematics class. He stated the reasons why he considers in this way are that the academic level of the inclusion student was very low, having problems in controlling the student and not having time for the student. Nearly half of the participants stated that they provided peer assistance to the students in the activities, and some participants guided the inclusion students personally. Some examples of participants' opinions are given below.

*I usually include this student in the games, which we generally do in the classroom, or when we take any students to the board and make an animation. So, the inclusion student would not feel being excluded (Mr. Murat).*

*I spend a lot of time during breaks, and sometimes I include [the inclusion student] to the art class. Otherwise, it is not possible in math class. We provide support education after school. I can only help her at that time (Naim teacher).*

*Sometimes, I send her to her friends, with whom she gets along very well. I also think that there are other things that she will learn from them (their peers) (Mrs. Ayşen).*

*I have to show and do it first. She needs my help/guidance (Mrs. Busra).*

*Eventually, since the child's level is not close to other friends, it is difficult to control her in the classroom and to spend time with her. You need to ignore the other students; you do not have a*

*chance to do a separate activity for her [inclusion student]. So, I do not see it necessary for her to attend activities. I wish it was possible, if a special education class belonging to these children was created and a special education teacher train them (Mr. Kadir).*

It was determined that the participants encountered some problems in the learning-teaching process in mathematics class. Participants stated that they could not spare time to apply teaching methods and activities for inclusion students. Most of the participants, who stated that the time was insufficient, expressed the importance of the support education rooms. In addition, the participants stated that they were not able to prepare appropriate tools and materials for the needs of the inclusion students, that the students easily forgot what they learned, that the parents made requests for class seating order and that the classes were crowded. In addition, some participants stated that students with normal development could not agree with the inclusion students. Some of the participants also emphasized the importance of informing students with normal development about the inclusion students. Some examples of participants' opinions are given below.

*We can do it [teaching] in the support education class, where we can come together and we have plenty of time. Besides, the biggest problem about these children is this; there is not enough time. Because these children cannot learn in the same time interval as their normal friends, they need extra time and one-to-one education. Eighty percent of inclusion students can actually improve with one-to-one teaching. For example, there is no possibility that if I did not teach one-to-one in the support education room, the student could not learn the current topics. It is because the child did not know, he learned something from math class but incomplete (Mr. Vedat).*

*Sometimes the material you prepare is irrelevant to the student's level. The child has no interest in achieving your desired gain or something totally unrelated happens (Mr. Murat).*

*Often the student goes home and forget what she just learned, regardless of how good you applied the method. (Mr. Mustafa).*

*Of course, students don't want to sit with this boy. It cannot be said that I have overcome this obstacle. Namely, whoever sits with him is not happy. It is because the child [inclusion student] has different issues other than level of education, for example, has behavioral problems. And other children think of him as a punishment given to him when sit together (Mr. Enes).*

*Sometimes parents asked us to seat their child here or there in the class seating order. Parents sometimes intervene [in class seating order] like that (Mr. Naim).*

*In the first place, I had students who did not want to sit with an inclusion student, because of the differences. But this was partly over when we dealt with individual differences in life knowledge course. In other words, when they talk about the differences and emphasize that they are different and that they must respect him; yes, we had a problem at first but I can say that we overcame them (Mrs. Emine).*

Some of the participants stated that they also had some problems in the support education room in the context of teaching mathematics to inclusion students. The participants stated that the education was carried out after school hours and so that they and the students were exhausted and that the students did not want to study individually. Some examples of participants' opinions are given below.

*Now, after the sixth hour, the school also gives support education courses. But frankly, after six hours, the education can become very tiring. You add on top of what you've been doing all day long. This is what I can say. I already feel very tired and the student also gets tired (Mrs. Busra).*

### Theme 3. Experiences in Measurement and Evaluation

The third theme reached in order to determine the participants' experiences with inclusion students in the context of teaching mathematics is "Measurement and Evaluation". Regarding the measurement and evaluation process 6 sub-themes were reached: "assessment and evaluation method", "evaluation criteria", "evaluation outside of mathematics class hours", "help" and "problems encountered".

The majority of the participants stated that they determined the success of the inclusion students verbally in form of questions and answers. In addition, the participants stated that they measured achievements of their inclusion student in a separate room with one-to-one meetings through visual supported written questions. However, Mrs. Büşra stated that she evaluated the success of the inclusion student by including her in the same written exam with her peers. Some examples of participants' opinions are given below.

*Generally, what I do is; I try to evaluate the student by letting her to verbally express herself. For example, what is addition? I try to evaluate the student's performance with the verbal expressions such as "addition is to multiply," "it is the sum of the two things when they come together and increase" (Mr. Ahmet).*

*I ask the student specific questions, in a written form. There are more visual questions. For example, 2 apples and 3 apples equal to what? (Mr. Arif).*

*[The inclusion student] takes the same exam with normal students, but her assessment is different. I want to see what she can do. It is because this student has improved herself very well (Mrs. Busra).*

Most of the participants stated that they consider gains in the IEP as the criterion in the evaluation of the mathematics achievement of the inclusion students. Some examples of participants' opinions are given below.

*In other words, we act according to IEP in the evaluation. The gain I have determined for this student, for example, can she write numbers from 1 to 10 or can she not? I evaluate it according to her specific situation (Mrs. Emine).*

Some of the participants stated that they determine success of inclusion students in the context of teaching mathematics during the hours apart from math class. These participants stated that they evaluated the success of the students during the break, in the support education room and in social activity classes. Some examples of participants' opinions are given below.

*I teach classes of music, painting and physical education very short. Since I do these lessons very short, I can also have time with the child [inclusion student]. It is not possible to focus on her during regular class. So, these support education rooms are very useful, you can provide one-to-one education (Mrs. Bade).*

Some of the participants stated that they guided inclusion students during the measurement and evaluation of their success in mathematics class. Participants stated that the reasons they help them were mostly due to poor reading and writing skills. Some examples of participants' opinions are given below.

*I help when he can't read the questions, then he understands. The boy[student] only tells the answer (Mr. Oguz).*

Most of the participants expressed the problem they faced the most during the measurement and evaluation process for inclusion students in the context of teaching mathematics as not being able to allocate sufficient time for inclusion students. Other problems that encountered by the inclusion students were particularly in expressing themselves inadequately, having poor reading and writing skills, difficulties experienced by primary school teachers in establishing appropriate assessment activities and being neutral towards the students, comparing inclusion students with the students who were normally developing, and the inattention of families of the inclusion students. On the other hand, some participants stated that they did not have any problems in the measurement and evaluation process of inclusion students in the context of teaching mathematics, and almost all of these participants stated that the inclusion student also received mathematics education in the support education room. In this context, it can be said that the support education rooms have a positive effect on the evaluation process. Some examples of participants' opinions are given below.

*We cannot expect children to answer the questions in a normal time; For example, I ask 3 questions, and I think that okay she can do them in 30 minutes. Sometimes the bell rings and the class get over but the student still may not pass to the third question (Mr. Vedat).*

*Due to the inability to express himself, he sometimes does not get answers to the questions that I think he knows the answers (Mrs. Elanur).*

*The student has literacy problems. And mathematics and literacy are compatible... (Ahmet teacher).*

*You can't do very simple. When you make it simple, they become very easy to answer. You cannot prepare very difficult questions also. It is because at that time it would be unrealistically difficult. In other words, we have difficulties in preparing the questions according to both the child's behaviors/level and the plan (Mrs. Emine).*

*Sometimes we can miss objectivity. It is because of that you spend time together with the student, you have an emotional bond with the student (Mr. Vedat).*

*I have following difficulty when evaluating other peers in the class criticizes me. Sometimes they say that you ask that questions to us, ours are difficult, his is easy and his score is high etc. (Mr. Ahmet).*

*Her mother is absolutely not look after child [in terms of her education]. She does not take care in following way; She says "let's not make him tired [the student] too much," "he does not want to do it when he is bored," "let's not make him stress." You can't get him to do homework. Her mother brings him school late, the students always comes late, and the school has a secondary importance for this student because of his family (Mrs. Fatma).*

*I have an advantage in my support education background. I have higher chance in one-to-one observation (Mrs. Büşra).*

## **DISCUSSION AND CONCLUSION**

In the study, it was aimed to determine experiences of primary school teachers who had inclusion students in their classes in the context of teaching mathematics. In line with this purpose, the experiences of elementary school teachers with inclusion students in the context of teaching mathematics were grouped under the themes of IEP preparation process, learning-teaching process and measurement and evaluation process and they were examined. Results of the research and suggestions in line with these results are given below.

### **Results of Experiences Regarding IEP Preparation Process**

According to the findings of the current study, it was determined that almost all of the participants prepared IEP for inclusion students in the context of teaching mathematics. The studies conducted by Everett (2017) and Voinea & Purcaru (2015), emphasizes the necessity of preparing IEP for students in mathematics education. The present study concluded that the participants mostly used rough evaluation forms in order to determine the gains when preparing IEP. As a matter of fact, Avcıoğlu (2013) suggested using rough assessment forms while determining the gains for inclusion students. In the current study, it was concluded that the participants basically determined addition and subtraction operations for inclusion students' daily life skills. In the studies conducted by Eripek, Özsoy & Özyürek (2002) and Snell & Brown (2000), it was stated that daily life skills such as four operations are of great importance for children with intellectual disabilities to live independently.

In the current study, most of the participants stated that they needed help when preparing IEP and they received the most help from school counselors. In their study, Vural & Yıkılmış (2008), emphasized the importance of school guidance teachers taking an active role in the inclusive education process. However, in the studies conducted by Akcan & İlgar (2016), AICI (2014), Karadeniz, Akar & Hayri (2015) and Pavri & Luftig (2000), it was determined that during the inclusive education process teachers could not get help. In the current research, it was determined that some participants did not prepare IEP. Participants stated that the following were effective in not preparing the IEP: the fact that the diagnostic student's diagnostic report was not sent by GRC on time, that the academic level of the inclusion student was considered to be too low to prepare IEP based on the doctor's statements and that the IEP was already prepared by the teacher providing support education at school. In line with the statements of the participants, it can be stated that they did not prepare IEP due to the inadequacy of inclusion students in their perception of mathematics achievements and they linked the reason for not preparing IEP with other institutions and teachers. In the studies conducted by Berkant & Atılğan (2017), Güleriyüz & Özdemir (2015) and Zeybek (2015), it was concluded that primary school teachers do not prepare IEP because they do not have sufficient knowledge about IEP.

In the present research, it was determined that the participants encountered some problems in the process of preparing IEP in the context of teaching mathematics. It was stated that the problems encountered were due to the primary school teachers (who could not able to determine the gains appropriate for the student's academic level and considering themselves as inexperienced about IEP), inclusion students (who could not express what they learned in terms of the gains), parents' of inclusion students (inadequate contribution). According to the research conducted by Karadeniz et al. (2015), middle school teachers who had inclusion students in their class had insufficient information about IEP, and Yılmaz & Batu (2016) stated that elementary school teachers who had inclusion students in their class had problems in determining the level of inclusion students and had a family reaction in accepting the student. These are similar to the findings of the current research.

### **Results Regarding Experiences Regarding the Learning-Teaching Process**

The current research determined that almost all of the participants used the materials that were arranged before/ready in the learning-teaching process for the mathematics class and they mostly aimed to observe gains concretely with help of tools and materials. The study done by Everett's (2017) showed that use of visual tips and reminders in teaching mathematics for inclusion students was effective. Çilingir Altınır & Artut (2017) and Duran (2011) found that students understand visual problems more easily and better in teaching mathematics. Some studies in the related literature (Ginsberg & Opper, 1967; Gün, 2013; Gürgür, 2008; Friend & Bursuck, 2006; Yönter, 2009) recommend to make concretization by using materials and activities in order to ensure effective learning of the students. In this context, it can be stated that concretization by using tools and materials for inclusion students in teaching mathematics may positively affect the inclusive education process.

The current study showed that most of the participants tried to determine the methods according to the levels of the students in mathematics class and in within this framework, they mostly used demonstration, teaching with play and drama methods.

It was also concluded that the participants mostly used the classical order in the classroom seating arrangement for inclusion students in the context of teaching mathematics. It was determined that most of the participants placed them in the closest places to the teacher in order to maintain control over the inclusion students, while some participants constantly changed their place to ensure that the inclusion students were interact with their friends. According to Sucuoglu and Kargin (2006), it is important for students with special needs to sit near the teacher for their participation in the class.

The present study concluded that almost all of the participants included inclusion students in activities such as games/plays and group work which were for all students in mathematics class. In this context, it was determined that the participants aimed to integrate the inclusion students with their peers and improve their self-confidence. It was determined that the participants could only apply individual activities to the inclusion students during breaks, social activities time, and in the supportive education room apart from mathematics class. Some participants suggested to teach mathematics to inclusion students in supportive education room. The positive opinions of some of the participants that they can spare time for inclusion students in the support education room emphasize the necessity of teaching mathematics in the support education rooms. The studies conducted by Ünay (2012) and Ünay (2015) concluded that the support education room significantly increases the mathematics achievement of the inclusion students compared to the general education classroom. It supports the findings of the present research. In the current study, it was found that almost half of the participants provided peer assistance to the inclusion students during the activities, while some participants helped the students by themselves. Brown, Odom, Li & Zercher (1999) concluded that students with special needs can participate in the same activity with students who develop normally if they can be guided accordingly. Everett (2017) stated that peer assistance for students with special needs was among the additional strategies that can be applied in mathematics lesson. According to Batu (2000), students with special needs get most of what they learn with the help of peers.

In the present research, it was concluded that the most frequently encountered problem in the learning-teaching process of the mathematics class was the insufficiency of time. Participants stated that when they were spending time with inclusion students, they neglected other students. Therefore, they could only apply their teaching methods in the supportive education room. Gökmen, Budak & Ertekin (2016) found that the primary reason that primary school teachers avoid to use materials in the context of teaching mathematics is that they find the time inadequate. According to some researches in the literature, it was concluded that primary school teachers could not allocate time for mainstreaming students both in mathematics (Karadeniz et al., 2015; Rakap & Kaczmar, 2010; Saraç & Çolak, 2012; Vural & Demolished, 2008) and in the entire education process (Esmer, Yılmaz, Güneş, Tarım & Delican, 2017; Gök, 2013; Horne & Timmons, 2009). These reports are similar to the findings of the present research. The current study articulated that although sufficient time could be allocated to the inclusion students in the support education rooms students and teachers providing support education feel tired because the education was carried out after school hours. The study conducted by Gün (2013) also reached similar findings and it was concluded that the inclusion students were reluctant because they were alone in the support education room.

According to the present study, it can be stated that the participants needed help because they had difficulty in allocating time for the inclusion students during learning-teaching process and because they were not able to determine the appropriate tools and materials for them. One of the participants stated that the equipment and materials should be prepared by specialists in the field of special education. Gürgür, Winter & Akçamete (2012) concluded that the collaboration of teachers and special education teachers in inclusive education classes was weak. Batu & Kırcaali-Iftar (2011), Berkant & Atilgan (2017), Comerford (1995), Sadioglu, Bilgin, Batu & Oksal (2013) and Will (1986) stressed on importance of special education teachers' help for primary school teachers in the process



of inclusive education. In this context, it can be stated that special education teachers should help primary school teachers in the process of preparing and applying material for inclusion students.

Some of the participants stated that informing students showing normal development about the inclusion students during the learning-teaching process in teaching mathematics positively affected the behavior about inclusion students. Karadeniz et al. (2015) and Saraç & Çolak (2012) reached findings that the teachers inform the students who show normal development about the inclusion students. These are similar to the findings of the present research. Kırcaali-Iftar (1998) stated that students with normal development should be informed about inclusion students and that would be beneficial for students with normal development as well.

### **Results Regarding Experiences for the Assessment and Evaluation Process**

In the present study, it was concluded that most of the participants verbally determined the achievements of the inclusion students with the question and answer method. In addition, it was determined that the participants measured the students' achievements, respectively, by means of written questions with visual support and one-to-one interviews. As a matter of fact, Everett (2017) stated that it is important to use visual tips in teaching mathematics to the inclusion students in the classrooms. In addition, Clements (1999) stated that concretization and visualizing the concepts that the students supposed to learn will make them learn easier and learning will be more permanent. In some studies (Mercer & Mercer, 2005; Miller & Hudson, 2006), it was stated that it is necessary to move from the concrete level to the abstract level while determining the students' levels of understanding in mathematics class. Accordingly, it can be stated that participants should use more visuals when evaluating students' achievements.

It was determined that the participants mostly based on IEP while determining the success of the inclusion students. In the study of Eliçin et al. (2013), the teachers determined the mathematics gains of the inclusion students on the basis of their rough assessment forms. Güven & Gürsel (2014) and Thompson & Thurlov (1999) concluded that the teachers made the evaluation of the success of the inclusion students according to their gains in the IEPs. In the research by Silvia, Munk & Bursuck (2005), the necessity of measuring and evaluating the success of inclusion students according to the gains in IEPs was emphasized. In the research, it was determined that some of the participants guided them in evaluating the inclusion students. Participants stated that the reason for helping the inclusion students is mostly that the inclusion students have poor literacy skills.

In the research, it was determined that some participants helped inclusion students in measuring and evaluating the success of them. Participants stated that the reasons for their help are mostly due to poor reading and writing skills of inclusion students. In addition, it was determined that some participants evaluated the gains of the inclusion students in the context of teaching mathematics during extra hours apart from mathematics class. These participants stated that they evaluated the gains of the students during the breaks, in the support education room and in social activities class.

It was determined that the participants encountered some problems in the measurement and evaluation process for the inclusion students. It was observed that the most frequently encountered problem in the measurement and evaluation process was the insufficiency of time. Participants also stated that the students' poor literacy skills and lack of attention [for their education] in the family negatively affect them. Spinelli (2002) showed that students' poor reading and writing skills were among the obstacles to mathematics teaching. In this regard, it can be stated that reading-writing skill affects teaching mathematics. Berkant & Atılgan (2017) and Sanır (2009) found that the students' parents were uninterested in inclusive education. These are similar to the findings of the present research. Bilen (2007), Güven & Gürsel (2014), Rakap & Kaczmarek (2010) and Sorani-Villanueva, McMahon, Crouch & Keys (2014) emphasized the importance of collaboration with the family in the success of inclusion students. In this context, it can be stated that the cooperation with families of inclusion students will indirectly affect the evaluation process in inclusive education.

The suggestions developed in line with the results of the current research are as follows:

- Primary school teachers should be provided with the necessary assistance and resources to be trained in the IEP preparation process.
- The current study showed that the support education room service was provided after the school hours and by primary school teachers. In addition, the participants stated that they mostly use the teachers' room since there is no support education room in their schools. Therefore, supportive education rooms that can be used only for inclusion students in schools should be provided and special education teachers should be appointed in these rooms.
- The participants stated that they could not assign sufficient time in the classroom to apply the teaching methods determined in the context of teaching mathematics and to evaluate student gains in a valid and reliable manner. Therefore, the number of support education rooms should be increased in schools.

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