Preschool Teachers' Opinions on the Mathematics Learning Process of Immigrant Children

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Abstract: A limited number of studies on the cognitive learning processes of immigrant children reveal that children have difficulties in learning mathematics. Studies to date have generally been carried out to understand the difficulties experienced by teachers in multicultural mathematics learning environments. However, it is important to understand children's own experiences to ensure that every child has access to quality mathematics education. This study aims to explore the mathematics learning process of immigrant children in the preschool period through teachers' observations and experiences about children. The study was designed with a case study, one of the qualitative research designs. The participants consist of 10 preschool teachers determined by purposive sampling. The data were obtained through semi-structured interviews. The interviews were transcribed and the data were analyzed by content analysis. The findings showed that teachers believed that the immigrant children in their classrooms have mathematical skills appropriate for their age or at a higher level. Teachers stated that immigrant children have difficulties in understanding and naming mathematical concepts and performing some mathematical skills. It has been determined that teachers play an organizer, facilitator and collaborative roles in the mathematics learning of immigrant children.

Keywords: Immigrant children, mathematics learning, preschool teacher

Okul Öncesi Öğretmenlerinin Göçmen Çocukların Matematik Öğrenme Sürecine İlişkin Görüşleri

Öz: Göçmen çocukların bilişsel öğrenme süreçlerine ilişkin yapılan sınırlı sayıda çalışma, çocukların matematik öğrenirken zorlandıklarını ortaya koymaktadır. Bugüne kadar yapılan çalışmalar, genellikle çok kültürlü matematik öğrenme ortamlarında öğretmenlerin yaşadığı zorlukları anlamaya yönelik olarak gerçekleştirilmiştir. Ancak, her çocuğun nitelikli matematik eğitimine erişimini sağlamak için çocukların kendi deneyimlerini anlamak önemlidir. Bu çalışmanın amacı, okul öncesi dönemdeki göçmen çocukların matematik öğrenme sürecini öğretmenlerin çocuklarla ilgili gözlemleri ve yaşantıları aracılığıyla keşfetmektir. Çalışma nitel araştırma yöntemlerinden durum çalışması ile desenlenmiştir. Çalışma grubunu amaçlı örnekleme yöntemi ile belirlenen 10 okul öncesi öğretmeni oluşturmaktadır. Araştırmanın verileri, yarı yapılandırılmış görüşmeler yoluyla elde edilmiştir. Görüşmeler yazılı hale getirilerek içerik

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analizi ile analiz edilmiştir. Elde edilen bulgulara göre öğretmenler sınıflarındaki göçmen çocukların yaşlarına uygun ya da daha üst düzeyde matematik becerisine sahip olduklarına inanmaktadırlar. Öğretmenler, göçmen çocukların matematik kavramlarını anlamakta, isimlendirmekte ve bazı matematik becerilerini yerine getirmekte zorlandıklarını ifade etmişlerdir. Öğretmenlerin, göçmen çocukların matematik öğrenmesinde düzenleyici, kolaylaştırıcı ve işbirlikçi rol aldıkları tespit edilmiştir.

Anahtar Kelimeler: Göçmen çocuklar, matematik öğrenme, okul öncesi öğretmeni

Introduction

With the increasing wave of immigration in recent years, many immigrant children have settled in Türkiye. According to the 2021-2022 data of Directorate of Migration Management ([Göç İdaresi Başkanlığı], 2022), there is a population of 5.013.631 foreigners, and almost 1.5 million of them are children 5-17 years of age. Of these children, 137.075 are preschool children (Directorate of Migration Management, 2022). The number of children who migrate to Türkiye and attend preschool education is increasing. As the number of children affected by the negative effects of migration increases, the importance of determining strategies for these children's learning is growing (Le Pichon et al., 2021). With the rise in the number of children receiving preschool education, it becomes important to support their development through the right strategies.

As a result of the crises and wars in other countries, Türkiye has become one of the countries that receive the most immigrants. Today, many children from countries such as East Turkestan, Syria and Iraq, as well as countries such as Iran, Egypt and Russia, live in Türkiye. Individuals living in Turkey and having migration experience have different legal statuses. Syrians, who make up the majority of individuals who migrated to our country, are in temporary protection status according to Türkiye's Law on Foreigners and International Protection [Yabancılar ve Uluslararası Koruma Kanun] (2013) and Temporary Protection Regulation [Geçici Koruma Yönetmeliği] (2014). Uyghur Turks who immigrated from East Turkestan have the status of immigrants in Türkiye (Karluk, 2018). Individuals who migrated from Afghanistan, on the other hand, are considered as conditional refugees within the scope of international protection or as immigrants who have not conditional refugee status (Karakaya & Karakaya, 2021). In this study, the term "immigrant children" is used regardless of children's legal status, since they have different legal statuses, but all have migration experiences.

Migration is a phenomenon that deeply affects children's lives (Erol & Savaş, 2022). It causes them to change their social environment and to try to get used to a new environment, while affecting them academically as well (Arslan & Ergül, 2022). In fact, the academic success of the child is affected by the family environment and conditions (Levine et al., 2010). In other words, children's living conditions play a decisive role in their academic success.

School is an important environment that will enable children with migration experience to recover from the effects of adverse conditions (Block et al., 2014). A school environment created by considering the characteristics of children with migration-background ensures that the children continue their education life. In particular, attending school in the early years have a positive impact on immigrant children's cognitive skills (Corazzini et al., 2021). Learning environments prepared for immigrant children's educational needs allow them to maximize their potential (de Heer et al., 2016).

As a phenomenon that changes almost all aspects of children's lives (Karakoç Demirkaya, 2020), migration also plays a substantial role in their learning process (Akay et al., 2017). Immigrant children need more support when learning mathematics because of their negative experiences (Le Pichon et al., 2021). Under these conditions, examining the mathematics learning process of children who have experienced migration is important in order to prepare a much more productive learning environment for them.

Theoretical Framework

This study, which was carried out to understand the mathematics learning process of immigrant children, is based on Vygotsky's Theory of Sociocultural Development. In the sociocultural understanding, it is argued that human activities occur through language and other symbol systems in the cultural context (John-Steiner & Mahn, 1996). Vygotsky argues that every child develops basic mental functions with features such as attention, perception and memory, as well as language use, reading and writing from experienced adults and peers around him. According to the sociocultural point of view, culture should not be neglected in order to accurately determine the abilities of children (Bodrova & Leong, 2007). The sociocultural perspective is guiding when examining the mathematics learning process of children who have a culture that is different from the dominant culture in the society.

Mathematics Learning Process of Immigrant Children

Mathematical skills in early childhood determine the child's mathematical success in later stages (Bailey et al., 2014; Jordan et al., 2007). Children tend to maintain the mathematics knowledge they acquired in the preschool period in the following years (Ginsburg et al., 2008). If a child has a high level of mathematics achievement in the preschool period, he or she can generally maintain this success in primary and secondary school (Bailey et al., 2014). For this reason, it is important to support children's mathematics learning in the preschool period.

Supporting children in mathematics at early ages allows them to be more successful in mathematics in later years. Children's mathematical development is affected by the conditions of the environment they live in (Levine et al., 2010). In fact, it has been found that the activities and conversations with children in the home environment affect their mathematical development (Gürgah Oğul & Aktaş Arnas, 2021). Immigrant children may need more support in terms of learning mathematics due to their living conditions and the deprivation they experience in many areas.

A limited number of studies conducted with immigrant children in the preschool period show that children are at risk in terms of cognitive skills in Türkiye (Erdemir, 2021). Pellizzoni et al. (2020) in their study with Italian, Yezidi and Syrian children found that children who were more deprived (Yezidi and Syrian children) were less successful in executive function and early math skills. Studies reveal that children who have different language and cultural characteristics from the structure commonly seen in society have lower academic achievement. For example, Gün and Çavuş Erdem (2014) found that children whose mother language is different from the language of instruction are less successful in mathematics than children who speak only Turkish.

Studies on children who have immigrated to Türkiye reveal that they face many problems at home and at school (Karslı Çalamak & Erdemir, 2019; Temel et al., 2017). Teachers state that immigrant children need more academic support (Arslan & Ergül, 2022). In addition, teachers working with immigrant children state that they had difficulties in teaching mathematics to children (Ergen & Şahin, 2019). In fact, learning mathematics is difficult for individuals whose

skills in the language of instruction are inadequate (Attar et al., 2020). In addition, teachers also reported that immigrant children in the preschool period had difficulty in concentrating and they needed to apply different strategies during the learning process (Özoruç & Dikici Sığırtmaç, 2022). At the same time, teachers reported that they needed support to follow the thinking processes of children (Yaylacı et al., 2017). These studies has highlighted that immigrant children struggle with learning issues.

Current Study

Considering that children's language and cultural backgrounds are effective in their academic skills (OECD, 2016), it is important to design mathematics activities that are compatible with their social realities (Martin, 2009). At this point, understanding the current learning processes of children can be a way to increase their success. Recent studies point to the social adaptation and relationship patterns of young immigrant children (e.g., Bozkurt Polat et al., 2021; Çiçekoğlu et al., 2019). However, the cognitive learning processes of immigrant children in the preschool period have not been fully revealed. In addition, it is seen that the existing information is structured for teacher practices in the mathematics learning process of children with a culture different from the dominant culture in the society (Allexsaht-Snider et al., 2020; Karslı Çalamak et al., 2022). This study makes an important contribution to the literature by focusing on the mathematics learning experiences of immigrant children, via preschool teachers' observation and experiences about the children's learning process. This study addresses the opinions of preschool teachers who have worked with immigrant children.

Examining the mathematics learning processes of immigrant children who struggle with difficult living conditions and who are disadvantaged due to their migration experience in the preschool period will be beneficial in order to offer them the highest level of support. Therefore, in the present study, it was aimed to obtain information about the mathematics learning process of immigrant children in the preschool period based on teachers' observations and experiences about them. The aim of our research was to explore the mathematics learning process of immigrant children in the preschool period. For this purpose, the following questions were answered:

1. What is the nature of the mathematics learning process of immigrant children in preschool during the year?
2. What are the difficulties encountered by immigrant children in the preschool period during the process of learning mathematics?
3. What role does the teacher play in the mathematics learning process of immigrant children in the preschool period?

Method

Research Design

The study was determined as a case study from qualitative research models. Case studies used in qualitative research include a detailed and in-depth examination of a situation or a system over a period of time (Creswell & Poth, 2018). This is important in terms of enabling a more holistic and humanistic understanding that case studies provide to handle a complex situation with all its aspects in its natural environment and make it researchable via a broad perspective by examination (Brown, 2008). In the present study, the mathematics learning process of immigrant children was considered as a case.

Participants

The participants consisted of 10 preschool teachers (8 females, 2 males) working with children aged 3-6 in the 2021-2022 academic year. The participants were determined by purposeful sampling. Purposeful sampling allows for an in-depth understanding of the determined situation (Patton, 2015). An inclusion criterion was adopted for identifying participants. The criterion for inclusion was the presence of at least one immigrant child in the teacher's class in the academic year preceding the data collection. While determining the participants, attempts were made to contact teachers in different provinces and districts as much as possible and attention was paid to the differences between the immigrant children in terms of country of origin. Thus, it was aimed to obtain richer information about the mathematics learning situation of immigrant children. Data saturation was taken into account when determining the number of teachers to be included in the study group. Data saturation is achieved by concluding that the data obtained will no longer reveal more categories (Merriam & Tisdell, 2016). In the present study, 10 teachers were interviewed and it was concluded that data saturation had been reached. The demographic characteristics of the participants are given in Table 1.

Table 1

The demographic characteristics of the participants

Participants	Age	Teaching experience	District/City	Age group	Number of immigrant children	Country of origin
T1	25	4 years	Şahinbey/Gaziantep	5-6	10	Syria
T2	33	5 years	Birecik/Şanlıurfa	5-6	3	Syria
T3	34	10 years	Merkez/Isparta	5-6	1	East Turkestan
T4	26	1 year	Altındağ/İzmir	4	1	Syria
T5	25	6 months	Bahçelievler/İstanbul	4-6	1	Syria
T6	35	15 years	Merkez/Isparta	5	1	Afghanistan
T7	28	3 years	Şehitkamil/Gaziantep	5	4	Syria
T8	29	5 years	Antakya/Hatay	5-6	13	Syria
T9	26	4 years	Reyhanlı/Hatay	5-6	25	Syria
T10	37	10 years	Uluborlu/Isparta	5	1	Syria

Table 1 shows that the experience of the teachers varied between 6 months and 15 years. The teachers worked in 6 different cities and 9 different districts. The age group of children differs from four and six. The number of immigrant children in the teachers' classes varies from one and 25 while the countries of origin of them were Syria, Afghanistan, and East Turkestan.

Data Collection Procedure

The study was carried out to examine the mathematics learning process of immigrant children. In order to gather information about this process, the opinions of preschool teachers were obtained. The demographic information of the preschool teachers participating in the study was obtained through a demographic information form created by the researchers. This form contained questions to obtain information such as the teacher's age, sex, and teaching experience.

In addition, semistructured interviews were conducted with preschool teachers who had immigrant children in their classes, in accordance with the purpose of the study. The semistructured interview is a data collection method in which there are no standard interview questions, the interview can be directed without disturbing the natural flow of the conversation within the subject and scope of the research, and additions and subtractions can be made to the interview questions (Yıldırım & Şimşek, 2011). The main reason for using the semistructured interview technique in the present study was to enable the teachers participating to convey their opinions, personal experiences, and knowledge in a clearer and more detailed and understandable way.

Interview questions were used during the semistructured interviews. The questions were prepared by the researchers and then presented to experts in the field of preschool education for their opinions. In line with the feedback given by the two experts, the questions were revised and made ready for use. Below are some examples of the questions:

- At what points did you observe that the immigrant child in your class had difficulties in learning math?
- What do you think would enable immigrant children to have a better time learning math?

During the data collection, communication was established with the teachers determined in the study group via a social messaging application, the purpose of the study was stated, and their consent to participate in the study was obtained. Then suitable hours were determined for the interview. The collection of data was achieved through online interviews via the Zoom application, phone calls, and face-to-face. Online interviews were conducted with 7 teachers, telephone interviews with 2 teachers, and face-to-face interviews with 1 teacher. The interviews lasted an average of 20 minutes. The interviews were recorded with the knowledge of the participants. The recordings were listened to again and transcribed by the researchers and made ready for analysis.

Data Analysis

The data of the research were obtained through interviews with the teachers. The interviews were recorded with their permission. The recordings of the interviews were transcribed. The written data were analyzed with content analysis using the qualitative data analysis program NVivo 10. During the data analysis, the names of the teachers were kept confidential and their files were analyzed by coding using T1, T2, and T3.

Validity and Reliability

Validity and reliability can be defined as the scientific strength of research in general terms (Şencan, 2005). The validity and reliability features must be ensured in a qualified study (Güler, 2021). In qualitative studies, credibility criteria should be used instead of validity and reliability (Merriam & Tisdell, 2016). For credibility, one or more of the credibility, reliability,

confirmability, and transferability criteria (Lincoln & Guba, 1985) must be specified (Creswell, 2003).

In order to ensure the credibility of this research, member checking was conducted with two of the participants. Thus, it was ensured that the data accurately reflected the views of the participants. In addition, researcher triangulation was ensured by the involvement of more than one researcher in the collection, analysis, and interpretation of data. The confirmability criterion was provided by direct quotations from the expressions used by the teachers participating in the study. The creation of the study group through purposeful sampling ensures that the results of the study are applicable to similar situations.

Ethical Consideration

The study was approved by Izmir Democracy University Social Sciences Institute Ethics Committee (2022-79/09.09.2022). While the participants were being determined, the teachers were informed about the research and those who agreed to participate were included. An informed consent form was obtained. The teachers were told they could leave at any stage of the interview, but no teacher wanted to do so. In addition, the expressions of the teachers were presented with their code names, keeping their names confidential.

Findings

The aim was to explore the mathematics learning process of immigrant children in the preschool period. The opinions of preschool teachers with immigrant children in their classes are presented under the headings of the mathematics skill levels of immigrant children, the difficulties encountered by immigrant children in the mathematics learning process, and the role of teachers in the mathematics learning process of immigrant children.

Mathematics Skill Levels of Immigrant Children

The teachers' views on the level of mathematics skills of immigrant children were examined. Most of the teachers (8 teachers) thought that the immigrant children in their class had better mathematics skills than their peers. For example, T1 explained this situation as follows:

"Actually, since it is a type of activity that requires less communication, there is no need to express much in Turkish. For the Turkish children, writing or numbers are much more advanced. For example, after learning the names of geometric shapes, they actually know them, but they just don't know how to express them in Turkish; when we ask them in their own language, they are actually at a much more advanced level…"

Similarly, T8 stated that immigrant children's mathematics skills are high with the following words:

"In mathematics, we include many skills such as comparison skills, sequencing skills, classification skills, pattern skills, rhythmic counting, three-dimensional objects, and part/whole concepts. I say this for all of them. In comparison, Syrian children were better in sequencing, pattern, cardinality, addition, subtraction…"

In addition, some teachers stated that the immigrant children in their classes had age-appropriate mathematics skills. Stating that the immigrant child in his class has the level of mathematical skills expected from his peers, T4 expressed this situation with the following words:

"First of all, when we talked about shapes and numbers, like every child, he was already at the beginning of a certain development, but it was like this: I could convey these mathematical concepts well while communicating with the Turkish children verbally, but I had to provide some more mathematical shapes and numbers with that child via visual support. I don't think that mathematics is a very difficult part."

Difficulties faced by Immigrant Children in the Process of Learning Mathematics

The teachers stated that there are some difficulties that immigrant children face in the process of learning mathematics. Within the scope of the study, the categories and subcategories related to the difficulties that immigrant children encounter while learning mathematics are presented in Table 2.

Table 2

Categories and subcategories related to the difficulties that immigrant children face while learning mathematics

Categories	Subcategories	Frequency
Understanding and labeling concepts	-	7
Applying mathematics skills	Operation	2
	Pattern	1

According to Table 2, most of the teachers (7 teachers) stated that the immigrant children had difficulties in labeling concepts in Turkish or in understanding the concept. The teachers stated that although the immigrant children knew most of the mathematical concepts in their mother language, they had difficulties during the activities because they could not name them in Turkish. Likewise, when the teacher explained a mathematical concept in Turkish, the immigrant children had difficulty in showing the appropriate object for the concept that the teacher mentioned. For example, T6 stated that although the children knew the meaning of the concept in mathematics, they could not label it as follows:

"They were good cognitively. They might have said it wrong because they did not know the concept in Turkish. For example, they know that two is two."

Similarly, T1 explained that the children had difficulty in labeling concepts as follows:

"Especially in geometric shapes, s/he knows what it is, but s/he does not know how to pronounce the name in Turkish, or s/he expresses it in his own language when saying it. We had a hard time learning these things."

In addition, T9, who stated that the immigrant children could not show the object appropriate to the concept, made the following statement:

"For example, when I say show the shapes, they can't do it."

In addition, three preschool teachers found that the immigrant children had difficulties in some mathematics skills. Two teachers stated that the immigrant children in their classes had difficulties with patterns. Regarding this situation, T5 stated the following:

"S/He had some difficulties with patterns; s/he could do simple patterns like establishing and maintaining patterns, but when we worked with complex patterns, s/he had difficulties in the workbooks."

In addition, one teacher mentioned that the immigrant children in their classes were unsuccessful in terms of operation skills. T10 stated the following:

"Our only problem is that we had a problem in the addition part, in the advanced dimension of mathematics. S/He could pronounce and repeat five when you showed five in numbers, or s/he could count when we put five objects in front of him, but we had trouble adding and subtracting. I couldn't get him/her to understand it."

Role of Teachers in the Mathematics Learning Process of Immigrant Children

The views of the preschool teachers regarding the roles of teachers in the mathematics learning process of immigrant children were analyzed. The roles of teachers in the mathematics learning process of immigrant children are presented in Table 3.

Table 3

The roles of teachers in the mathematics learning process of immigrant children

Categories	Subcategories	Frequency
Organizer Role	Finding an Interpreter	3
	Organizing the Education Environment	3
	Designing a Learning Process	2
Facilitator Role	Supporting Peer Learning	4
	Gamification	4
	Visualization	4
	Demonstration	2
	Reducing activities to a simpler level	1
	Using Learning Centers	1
	Using Songs	1
	Repeating	1
Collaborator Role	Using Technology	5
	Participation in Home Education Activities	4
	Individual Interviews	2

As seen in Table 3, the roles of teachers in the mathematics learning process of immigrant children are grouped into three categories: organizer, facilitator, and collaborator. First, teachers acted as organizers in the mathematics learning process of immigrant children. Most of the teachers (9 teachers) mentioned that they played an organizer role in the learning process by making some preparations when they learned that there were immigrant children in their classes. When some of the teachers (3 teachers) learned that there would be immigrant children in their classes, they sought an interpreter to enable them to communicate with them. Regarding this issue, T1 used the following statements:

"Our first hassle was how we could come to an agreement, and in this process, since there are 1st, 2nd, 3rd, and 4th grade students in our school…, s/he can speak Turkish better. I chose children from every class that I could contact constantly. When I could not get through to the children or during the first week of adjustment, I sought help from those children, especially when contacting the parents."

In addition, some of the teachers (3 teachers) stated that they designed a learning process by considering the immigrant children in their classes in the first days of school. T8 explained this situation as follows:

"I paid attention to forming heterogeneous groups, playing games involving cooperation and cohesion, taking into account their characteristics in many respects."

In addition, when the teachers (2 teachers) learned that there were immigrant children in their classes, they made some adjustments to the educational environment within the scope of their organizer role. For example, T10 explained the changes he made to the educational environment as follows:

"Honestly, I didn't even know how to prepare. I just tried to make progress that way by increasing the visuals, and it worked."

T9 stated that he organized the educational environment as follows:

"After my first year, when I realized that I could not communicate with these children only linguistically, we ordered a printer and had a projector installed in our classroom, either visually or by telling the administration."

Second, teachers acted as facilitators in the mathematics learning process of immigrant children. Teachers have used many strategies to make it easier for immigrant children to learn mathematics. These are supporting peer learning (4 teachers), gamification (4 teachers), visualization (4 teachers), demonstration (2 teachers), reducing activities to a simpler level (1 teacher), making use of learning centers (1 teacher), and using songs (1 teacher) and repetition (1 teacher). One of the most commonly used strategies by teachers to facilitate children's learning of mathematics is to support peer learning. T5 expressed his support for peer learning as follows:

"Sometimes his/her friends helped. I was directing his/her friends so that I could have a dialogue with his/her friends and also support peer education, and when his/her friends told me, s/he immediately closed it."

The other strategy most commonly used by teachers to facilitate children's learning of mathematics is gamification. T7 stated that he used the gamification strategy as follows:

"If I gave a separate task to other children, I would provide that number in Turkish, for example, during the activity process, I would turn it into a game. First, we were saying the number in Turkish; then I was showing the number in the form of a game. Like where is the one. I tried to provide support with games like this."

Another strategy frequently used by teachers to facilitate children's learning of mathematics is visualization. T9 stated that he used visualization as follows:

"Then I look at activities, three-dimensional activities that I can do. For example, we do activities with tongue depressor, triangles, squares, and rectangles. In this way, I pay attention to prepare materials that children can learn with by seeing and examining."

Third, the teachers took on the role of collaborators in the mathematics learning process of immigrant children. Almost all of the teachers (9 teachers) stated that they cooperated with the families in the mathematics learning process of immigrant children. The teachers used different strategies when collaborating with the families of immigrant children. These strategies are grouped under three headings: using technology (5 teachers), ensuring participation in homeschooling activities (4 teachers), and individual interviews (2 teachers).

Teachers who cooperated with families via the strategy of using technology stated that they shared using the application called WhatsApp, a social media tool. Stating that they were trying to communicate with the families through WhatsApp groups, T5 used the following words:

"We had a WhatsApp group and they (the families of the immigrant children) were also in it. They were probably translating into their own language using Google Translate because when they messaged me, they used Arabic. I was trying to understand by translation."

In addition, teachers who use the strategy of ensuring participation in home education activities stated that they sent worksheets to the immigrant children's homes to enable them to work with their families and suggested activities to do at home. One of the teachers who used the strategy of ensuring participation in home education activities, T1, stated the following about the subject:

"Among the activities they can do with their parents, there was an art activity, for example. There were water buoyancy activities with numbers written on the flowers and many shapes or points drawn. I also suggested family involvement activities that the child could not do alone but would get help with from his or her family."

In addition, two teachers stated that immigrant children use the strategy of individual interviews to communicate with their families. T9, one of the teachers who had one-on-one interviews with the families of immigrant children about education at school, made the following statements:

"Like every citizen, parents may be uninterested in their children's learning process. I also invite them to school."

Teachers who used different strategies to communicate with the families stated that some families had difficulty in participating despite the strategies teachers used. For example, T10, one of the teachers who used the strategy of ensuring participation in home education activities, stated that some situations prevent families from participating in educational activities as follows:

"When I gave homework, I couldn't get feedback. Most of the time, some of the pages were done and some of them weren't. She was the eldest child of the mother, who had four children besides her and was also pregnant. The father already worked in shifts. Who can take interest in it at home and how much? It was caused by that. Too many families were never interested or checked about homework."

Discussion

In the present study, in which the aim was to explore the mathematics learning process of immigrant children in the preschool period, the views of preschool teachers who had immigrant children in their classes were examined. The study contributes to the developing literature on the

learning process of immigrant children based on teachers' observations of preschool children's mathematics learning in the classroom.

As a result of the research, important findings were obtained regarding the learning of mathematics by immigrant children. First of all, an important finding obtained is that, according to the opinions of the teachers, immigrant children have mathematical skills appropriate for their age or of a higher level. Most of the preschool teachers participating in the study argued that the immigrant children in their classes performed according to their age or even better in terms of mathematics skills. Although immigrant children have difficulties in many learning experiences and face failure due to the different language of instruction (Aydın & Kaya, 2019), they can understand mathematics more easily compared to other fields by making use of symbols in mathematical experiences (Çimşir & Baysal, 2020). Bolat (2021), in his study with primary school teachers, found that teachers think that Syrian children are more successful in mathematics than in literacy. Although mathematical experiences sometimes require verbal expressions, children can succeed in mathematics more quickly with the help of symbols. Similarly, Valencia-Mazzanti and Karslı-Çalamak (2022) revealed in their study that Turkish teachers believe that young children with migration experience can succeed in mathematics.

Secondly, as a result of the research, it was determined that immigrant children encountered some difficulties during the mathematics learning process in the preschool period. The teachers stated that immigrant children had difficulties in understanding and naming concepts while learning mathematics. One of the situations most emphasized by the teachers in the study was that immigrant children had difficulty in understanding the concept of mathematics that the teacher mentioned during mathematics activities. According to the teachers participating in the study, the biggest reason why children have difficulty in understanding and naming mathematical concepts is their inadequacy in Turkish grammar. Although children know a mathematical concept in their mother language, they cannot show that they know it because they cannot say it in Turkish. Vygotsky's (1978) sociocultural theory was supported with the teacher's opinions about the language difficulties in this study. Teachers emphasized that there was a link between language and math learning of children while they suggested that children have difficulty in expressing the verbal content of mathematics. One of the biggest challenges that immigrant children have to overcome is learning the complex language of science (Miller, 2009). The language barrier of immigrant children prevents their access to education (Szente et al., 2006). Immigrant children do not undergo any language training before they receive preschool education in Türkiye. Starting preschool education without taking Turkish lessons and then continuing to primary school increases the gap between these children and their peers (Aydın & Kaya, 2017).

At the same time, according to the opinions of the teachers participating in the study, immigrant children have difficulties in applying some mathematical skills. Some of the teachers observed that immigrant children had difficulties with processes and patterns. Contrary to this finding, Bolat (2021) found in his study with primary school students that immigrant children were successful in performing transactions but unsuccessful in solving problems. Similarly, primary school teachers stated that immigrant children lacked group work, homework, and problem-solving skills, but they enjoyed using skills such as the four operations (Dağlı, 2020). The fact that these two studies (Bolat, 2021; Dağlı, 2020) conducted with primary school students yielded findings different from those of the current study is because the operation skills in primary school are performed with more numbers. In the preschool period, the teacher directs the children to verbal problems so that they can perform operations (Aktaş Arnas & Tarım, 2020). In

the present study, the teachers stated that the children had difficulties with operations and patterns. Looking at these skills, it is noteworthy that they are skills that require language proficiency. Children are expected to use their verbal problem-solving skills while performing operations in preschool education. Verbal problems are difficult to understand for children who are deficient in Turkish.

Third, as a result of the research, it was determined that preschool teachers play different roles such as organizer, facilitator, and collaborator in the mathematics learning process of immigrant children. Within the scope of their regulatory roles, teachers sought ways to come to an understanding with the children, designed learning processes taking into account the different characteristics of the children, and made arrangements in educational environments. A qualified multicultural education requires sharing the feelings and experiences of children who differ in terms of factors such as color, language, and race (Nieto & Bode, 2008). Preschool teachers make it easier for children to adapt to the class when they plan activities or make some changes to the learning process considering immigrant children. These arrangements made by teachers help children get more out of their learning experience.

In addition, the teachers facilitated children's learning of mathematics by using strategies such as supporting peer learning, gamification, and visualization within the scope of their facilitator roles. The findings of the study support those of the study by Karslı Çalamak et al. (2022) who found that teachers offer immigrant children the opportunity to learn through cooperative learning and play during mathematics activities. Factors such as giving equal chances to the children, establishing an equal amount of dialogue, and learning by working together are very important in multicultural education (Gorski, 2010).

In addition, it was determined in the study that the teachers tried to cooperate with the families in the mathematics learning process of children by using different family participation strategies within the scope of their collaborative roles. This finding is consistent with that reported by Ördek İnceoğlu et al. (2017). Ördek İnceoğlu et al. (2017) found that preschool teachers working with Syrian families employ many strategies such as individual meetings, social organizations, and participation in activities at home. Most of the teachers who participated in the study stated that they had difficulties in learning mathematics due to the Turkish language inadequacy of the children. In this case, the cooperation of teachers with the families will help the children achieve success in the learning process of mathematics much faster. Children's academic language proficiency in their mother language is the determinant of academic language development in the second language (Tucker, 1999; Yazıcı & Temel, 2011). For this reason, using the language of mathematics in the mother language of their children at home is one way to increase the level of using the language of mathematics in the language of education. Studies (Gürgah Oğul & Aktaş Arnas, 2021; Susperreguy et al., 2020) revealed that the mathematical activities that families do at home with their children and the mathematical language input they provide to their children increase the children's mathematical success. On the other hand, some of the teachers who participated in the study mentioned that the families had difficulties in participating in education. This finding of the study is supported by the finding from Konstantinos and Paida's (2020) study that the families of immigrant children have little contact with the school. Ördek İnceoğlu et al. (2017) found that the families of Syrian children attending preschool education were not effectively involved in family participation activities. Support of immigrant children by their families has an important role in their adaptation to school and academic success (Oikonomidoy & Karam, 2020). Preschool teachers can help families support

their children more by identifying the factors that prevent the participation of families and using appropriate participation strategies for families (Aktaş Arnas, 2013).

The present study, in which the aim was to explain the mathematics learning process of immigrant children, has some limitations. First, the findings are based on teachers' opinions. Observing the interaction of immigrant children with their teacher in the classroom in later studies may provide more detailed information on how children learn. Second, this study reflected the opinions of the preschool teacher who has varied number of immigrant children in their classes. The future studies may conduct with the teachers working with similar number of immigrant children. In addition, in our study, children's mathematics learning process was discussed only in the context of school. Studying how this process works at home can help us understand more holistically how immigrant children cope with learning mathematics.

In conclusion, in the present study, findings were obtained in terms of the mathematics skill levels of immigrant children in the preschool period during the mathematics learning process, the difficulties they encounter in this process, and the roles of teachers in the children's mathematics learning process. The study helps us to develop an understanding of how immigrant children cope with the mathematics learning process through these findings.

Recommendations

According to the findings of the study, immigrant children often have difficulties during their mathematical experiences in the classroom, even if they have age-appropriate mathematics skills. These difficulties are usually due to the Turkish language inadequacy of the children. Language inadequacy results in the children lagging behind their peers. This learning difference between children makes it difficult for immigrant children to adapt to their environment. The competence of preschool teachers in multicultural education will help migrant children to have effective learning experiences. With the increase in the number of immigrant children attending school today, increasing the knowledge of teachers about multicultural education environments may help children experience fewer difficulties when they are included in this type of classroom environment. From this point of view, it may be useful to review teacher training programs in terms of multicultural education. In Turkey, education policies should be considered in order to eliminate the difficulties faced by teachers in education and the difficulties that children encounter in the learning process.

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Kaynakça

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Geniş Türkçe Özet

Giriş

Okul öncesi dönemdeki göçmen çocuklarla yapılan sınırlı sayıda araştırma, çocukların bilişsel beceriler açısından risk altında olduğu göstermektedir (örn. Erdemir, 2021; Pellizzoni vd., 2020). Öğretmenler, göçmen çocukların akademik yönden daha fazla desteğe ihtiyaç duyduğunu dile getirmektedirler (Arslan & Ergül, 2022). Ayrıca, göçmen çocuklarla çalışan öğretmenler, çocuklara matematik öğretmekte zorlandıklarını belirtmişlerdir (Ergen & Şahin, 2019). Nitekim, matematik öğrenme, öğretim dilinde yetersiz bireyler için zorlaşmaktadır (Attar vd., 2020). Bu noktada çocukların mevcut öğrenme süreçlerini anlamak, başarılarının artırılması için izlenecek bir yol olabilir. Son dönemde yapılan çalışmalar küçük yaştaki göçmen çocukların sosyal uyumlarına ve ilişki örüntülerine işaret etmektedir (örn. Bozkurt Polat vd., 2021; Çiçekoğlu vd., 2019). Ancak, okul öncesi dönemdeki göçmen çocukların bilişsel öğrenme süreçleri tam olarak ortaya koyulamamıştır. Bunun yanında, mevcut bilgilerin de toplumdaki baskın kültürden farklı bir kültüre sahip çocukların matematik öğrenme sürecinde öğretmen uygulamalarına yönelik olarak yapılandırıldığı görülmektedir (Allexsaht-Snider vd., 2020; Karslı Çalamak vd., 2022). Bu çalışma, öğretmenlerin gözlemlerine ve yaşantılarına dayanarak göçmen çocukların matematik öğrenme deneyimlerine odaklanması ile literatüre önemli bir katkı getirmektedir. Bu araştırmanın amacı, okul öncesi dönemdeki göçmen çocukların matematik öğrenme sürecini keşfetmektir. Bu amaç doğrultusunda aşağıdaki sorulara yanıt aranmaktadır:

1. Yıl boyunca okul öncesi dönemdeki göçmen çocukların matematik öğrenme süreci nasıldır?
2. Okul öncesi dönemdeki göçmen çocukların matematik öğrenme sürecinde karşılaştıkları zorluklar nelerdir?
3. Okul öncesi dönemdeki göçmen çocukların matematik öğrenme sürecinde öğretmen nasıl bir rol almaktadır?

Yöntem

Bu çalışma, nitel araştırma modellerinden durum çalışması olarak desenlenmiştir. Nitel araştırmalarda kullanılan durum çalışması bir durumu ya da bir sistemi belli bir zaman aralığında detaylı ve derin bir şekilde incelenmesini içerir (Creswell & Poth, 2018). Çalışma grubu 2021-2022 eğitim öğretim yılında 3-6 yaş aralığındaki çocuklarla çalışan 10 okul öncesi öğretmeninden (8 kadın, 2 erkek) oluşmaktadır. Çalışma grubu, amaçlı örnekleme yöntemi ile belirlenmiştir. Amaçlı örnekleme, belirlenen durumun derinlemesine anlaşılmasına olanak sağlamaktadır (Patton, 2015). Katılımcıların belirlenmesinde bir dahil etme kriteri benimsenmiştir. Çalışma grubuna dahil etme kriteri, veri toplama sürecinden önceki eğitim öğretim yılında öğretmenin sınıfında en az bir göçmen çocuk bulunmasıdır.

Göçmen çocukların matematik öğrenme sürecini irdelemek amacıyla gerçekleştirilen bu çalışmada okul öncesi öğretmenlerinin görüşlerine başvurulmuştur. Çalışmaya katılan okul öncesi öğretmenlerinin demografik bilgileri "demografik bilgi formu" aracılığıyla elde edilmiştir. Ayrıca, çalışmanın amacına uygun olarak okul öncesi öğretmenleriyle yarı yapılandırılmış görüşmeler gerçekleştirilmiştir. Görüşmeler ortalama 20 dakika sürmüştür. Görüşme kayıtları

araştırmacılar tarafından tekrar dinlenerek deşifre edilmiştir. Yazılı hale getirilen veriler, NVivo 10 nitel veri analizi programı kullanılarak içerik analizine tabi tutulmuştur.

Bulgular

Okul öncesi dönemdeki göçmen çocukların matematik öğrenme sürecini keşfetmeyi amaçlayan bu çalışmada sınıflarında göçmen çocuk bulunan okul öncesi öğretmenlerinin görüşleri, göçmen çocukların matematik beceri düzeyleri, matematik öğrenme sürecinde göçmen çocukların karşılaştıkları zorluklar ve göçmen çocukların matematik öğrenme sürecinde öğretmenlerin rolü başlıkları altında sunulmuştur. İlk olarak, öğretmenlerden çoğu (8 öğretmen) sınıflarındaki göçmen çocukların yaşıtlarına göre daha iyi düzeyde matematik becerisine sahip olduklarına inanmaktadırlar. İkincisi, öğretmenler, göçmen çocukların matematik öğrenme sürecinde karşılaştıkları bazı zorluklar olduğunu belirtmiştir. Öğretmenlerden çoğu (7 öğretmen) göçmen çocukların kavramları Türkçe olarak isimlendirmekte ya da söylenen kavramı anlamakta zorluk çektiklerini belirtmişlerdir. Öğretmenler, göçmen çocukların matematik kavramlarının çoğunu kendi anadillerinde bilmelerine rağmen, Türkçesini isimlendiremedikleri için etkinlikler sırasında zorlandıklarını ifade etmişlerdir. Aynı şekilde, öğretmen bir matematik kavramını Türkçe olarak söylediğinde göçmen çocuklar öğretmenin söylediği kavrama uygun nesneyi göstermekte zorluk çekmektedirler. Ayrıca üç okul öncesi öğretmeni göçmen çocukların bazı matematik becerilerinde zorlandıklarını tespit etmişlerdir. İki öğretmen sınıflarındaki göçmen çocukların örüntü yaparken zorlandıklarını ifade etmiştir. Bir öğretmen ise sınıflarındaki göçmen çocukların işlem yapma becerisinde başarısız olduklarından bahsetmiştir. Üçüncüsü, göçmen çocukların matematik öğrenme sürecinde öğretmenlerin aldıkları rollere ilişkin okul öncesi öğretmenlerinin görüşleri analiz edilmiştir. Göçmen çocukların matematik öğrenme sürecinde öğretmenlerin aldıkları roller düzenleyici, kolaylaştırıcı, iş birlikçi olmak üzere üç başlık altında toplanmıştır.

Tartışma

Araştırmaya katılan okul öncesi öğretmenlerinin çoğu, sınıflarındaki göçmen çocukların matematik beceri düzeyi bakımından yaşına uygun hatta daha iyi performans gösterdikleri görüşünü savunmaktadırlar. Göçmen çocuklar matematiksel deneyimlerdeki sembollerden faydalanarak diğer alanlarla karşılaştırıldığında matematiği daha kolay anlayabilirler (Çimşir & Baysal, 2020).

Çalışmada öğretmenlerin en çok vurguladığı durumlardan biri, göçmen çocukların matematik etkinlikleri sırasında öğretmenin söylediği matematik kavramını anlamakta güçlük çektikleridir. Çalışmaya katılan öğretmenlere göre çocukların matematik kavramlarını anlamakta ve isimlendirmekte zorlanmalarının en büyük nedeni Türkçe dil bilgisi konusundaki yetersizlikleridir. Çocuklar anadillerinde bir matematik kavramını bilmesine rağmen Türkçe olarak o kavramı söyleyemediği için bildiğini gösterememektedir. Göçmen çocukların üstesinden gelmesi gereken en büyük zorluklardan biri karmaşık bilim dilini öğrenmektir (Miller, 2009). Göçmen çocukların dil engeli, eğitime erişimlerini engellemektedir (Szente vd., 2006). Türkçe dersi almadan okul öncesi eğitime başlamaları ve daha sonra ilkokula devam etmeleri çocukların yaşıtlarıyla arasındaki uçurumu artırmaktadır (Aydın & Kaya, 2017).

Öğretmenlerin bazıları göçmen çocukların işlem ve örüntü yapmakta zorlandıklarını gözlemlemişlerdir. Bu bulgunun tersine Bolat (2021) ilkokul öğrencileriyle yaptığı çalışmada göçmen çocukların işlem yapmakta başarılı olduklarını ancak problem çözmekte başarısız olduklarını tespit etmiştir. Benzer şekilde ilkokul öğretmenleri, göçmen çocukların grup

çalışmalarında, ödevlerde, problem çözme becerilerinde eksik olduklarını ancak dört işlem gibi becerileri severek yaptıklarını belirtmişlerdir (Dağlı, 2020). İlkokul öğrencileriyle yapılan bu iki çalışmanın (Bolat, 2021; Dağlı, 2020) mevcut çalışmadan farklı bulgulara ulaşması, ilkokuldaki işlem becerilerinin daha çok sayılarla gerçekleştirilmesinden kaynaklanmaktadır.

Öğretmenler düzenleyici rolleri kapsamında çocuklarla anlaşmanın yollarını aramış, çocukların farklı özelliklerini dikkate alarak öğrenme süreçleri tasarlamış ve eğitim ortamlarında düzenlemeler yapmıştır. Nitelikli bir çokkültürlü eğitim renk, dil, ırk gibi faktörler bakımından farklılaşan çocukların duygularını ve deneyimlerini paylaşmayı gerektirmektedir (Nieto & Bode, 2008).

Bunun yanında, öğretmenler kolaylaştırıcı rolleri kapsamında akran öğrenmesini destekleme, oyunlaştırma, görselleştirme gibi stratejileri kullanarak çocukların matematik öğrenmesini kolaylaştırmışlardır. Benzer olarak, Karslı Çalamak vd. (2022) öğretmenlerin göçmen çocuklara matematik etkinlikleri sırasında iş birlikli öğrenme ve oyun yoluyla öğrenme fırsatı sunduklarını bulmuşlardır. Çokkültürlü eğitimde çocuklara eşit şans verilmesi, eşit miktarda diyalog kurulması, çocukların ortak çalışma ile öğrenmesi gibi faktörler çok önemlidir (Gorski, 2010).

Ayrıca çalışmada öğretmenlerin işbirlikçi rolleri kapsamında farklı aile katılım stratejileri kullanarak çocukların matematik öğrenme sürecinde ailelerle iş birliği yapmaya çalıştıkları tespit edilmiştir. Benzer şekilde, Ördek İnceoğlu vd. (2017) Suriyeli ailelerle çalışan okul öncesi öğretmenlerinin bireysel görüşmeler, sosyal organizasyonlar, evdeki etkinliklere katılımı sağlama gibi birçok stratejiyi işe koştuklarını bulmuşlardır.

Sonuç ve Öneriler

Araştırmanın bulgularına göre göçmen çocuklar, yaşlarına uygun matematik becerilerine sahip olsalar bile sınıftaki matematik deneyimleri sırasında sıklıkla zorluk yaşamaktadırlar. Bu güçlükler genellikle çocukların Türkçe dil yetersizliğinden kaynaklanmaktadır. Dil yetersizliği, çocukların akranlarından geri kalmasına neden olur. Çocuklar arasındaki bu öğrenme farklılığı, göçmen çocukların çevrelerine uyum sağlamalarını zorlaştırmaktadır. Okul öncesi öğretmenlerinin çokkültürlü eğitimdeki yetkinliği, göçmen çocukların etkili öğrenme deneyimleri yaşamalarına yardımcı olacaktır. Türkiye'de öğretmenlerin eğitimde karşılaştıkları zorluklar ve çocukların öğrenme sürecinde karşılaştıkları güçlüklerin ortadan kaldırılması için eğitim politikaları dikkatle ele alınmalıdır.