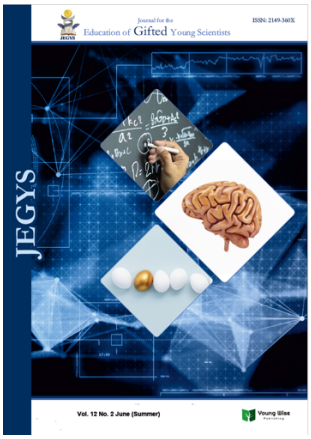
JEGYS

Journal for the
Education of Gifted Young Scientists

ISSN: 2149-360X

Vol. 12 No. 2 June (Summer)

Young Wise Publishing



Journal for the Education of Gifted Young Scientists
e-ISSN: 2149- 360X

June 2024 (Summer) Issue Full Files

Young Wise Publishing

Editorial Board of JEGYS

Journal for the Education of Gifted Young Scientists
e-ISSN: 2149- 360X
June 2024 (Summer), Vol. 12 No. 2
https://dergipark.org.tr/en/pub/jegys

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Absracting & Indexing
H.W. Wilson Education Full Text Database Covarage List, Index Copernicus, European Reference Index for the Humanities and Social Sciences (ERIH PLUS), Open Academic Journal Index (OAJI), Udledge, WorldCat (OCLC), ResarchBib, EZB, SOBIAD, Google Scholar, Scilit.
Note: You can click on index titles for checking

Young Wise Publishing/Genç Bilge Yayıncılık
Address 2: Bahcelievler District 3015 St. No:9/1, Isparta, Turkiye
Web site: http://gencbilgeyayincilik.com/ E-mail: gencbilgeyayincilik@gmail.com

Journal for the Education of Gifted Young Scientists, 12(2), 47-62, June 2024
e-ISSN: 2149- 360X
jegys.org
dergipark.org.tr/jegys

Young Wise Publishing
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Research Article

Examining the pre-service science teachers views on intelligence games used in science teaching[1]

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Article Info

Received: 5 April 2024
Accepted: 27 June 2024
Available online: 30 June 2024

Keywords
Intelligence game
Science teaching
Teacher education

Abstract

In this study, the relationship between classroom teachers' professional commitment and This study aims to examine pre-service science teachers' views on the use of different intelligence games in science teaching. The research was designed in a case study pattern. The research study group consists of 19 second-year pre-service teachers studying in the science teaching undergraduate program at a state university in the fall semester of the 2020-2021 academic year. Intelligence games were introduced to the participants in the online seminars given for 6 weeks. They were asked to plan a science teaching related to the intelligence game of the week and to fill out a form to express their opinions every week, and at the end of the seminars a focus group interview was conducted. Data collected through weekly opinion forms was analyzed through content analysis and the data gathered from focus group interviews were analyzed through descriptive analysis. At the end, it has been understood that pre-service science teachers generally think that intelligence games are useful for science teaching and believe that they make learning permanent and fun in science education. The opinions of pre-service science vary depending on the game. While preservice teachers evaluated Magic Pyramid and Missing Words as the most useful intelligence games for science teaching, they found the Kendoku game less suitable for science teaching.

To cite this article:

Yazgan, R.S., & Tezcan, G. (2024). Examining the pre-service science teachers views on intelligence games used in science teaching *Journal for the Education of Gifted Young Scientists*, *12*(2), 47-62. DOI: http://dx.doi.org/10.17478/jegys.1465988

Introduction

Play is a natural and fun way of learning from childhood onwards. Play triggers our brain's dopamine-reward system, keeping us motivated. The playing process of a well-designed game leads to focused engagement in the learning processes (Myers & Reigeluth, 2017). Educational games are games that aim to teach a specific concept or target behavior to an individual or individuals (Aksoy, 2014). Educational games support and develop students' skills such as using imagination, evaluating information, competing, and making decisions (Prensky, 2008; Yazıcıoğlu & Çavuş Güngören, 2019).

Educational games are divided into digital games and non-digital games (Li & Tsai, 2013). Digital games are games for entertainment purposes played with tools such as computers, tablets and phones. Non-digital games, on the other hand, are games that can be played with traditional methods such as paper, pencil, or any game object, as well as games

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that use physical limbs such as hand-foot coordination (Uzun et al., 2013). Intelligence games are counted among the educational games in the non-digital games group.

Intelligence games involve cognitive strategies in which an individual filters his/her solutions through a specific thought filter in order to reach a solution (Alessi & Trollip, 2001). These games are also accepted as brain-building or brain-training games because they provide brain gymnastics (Ott & Pozzi, 2012). Students should find the most accurate way to reach the result in the shortest time possible, which contributes to the development of skills such as decision-making, trial and error, using prior knowledge, and developing alternative ways to solve problems (Arslan & Dilci, 2018).

Intelligence games include reasoning and processing games, verbal games, memory games, strategy games, geometric-mechanical games and intelligence questions (Ministry of National Education [MoNE], 2013; MoNE, 2016). Examples of reasoning and operation games are Sudoku, Alphabet Linking, Admiral Sunk, Magic Pyramid, Kakuro, Kendoku, Operation Square, Futoshiki (MoNE, 2013). Anagrams, Missing Words and Word Hunt are verbal games, while Picture Recall and Picture Matching are memory games; games such as Chess, Checkers, Mangala, Tik-Tak-Toe are strategy games, while Jenga, Tangram and Mikado are geometric-mechanical games (MoNE, 2013). Examples of intelligence questions are Wolf-Lamb-Ot, Three Light Bulbs, 12 Balls, Liar-Corrector (MoNE, 2013).

Intelligence games are thought to be an educational tool that brings together the similarities and close relationships between different disciplines and develops students' ability to think at a higher level and use the knowledge they learn in daily life (Ebner & Holzinger, 2007). However, in Turkey, intelligence games are mostly associated with mathematics courses. Çağan and Usta (2023) found that intelligence games increased the mathematics achievement of middle school students, while Yöndemli and Taş (2018) found that they had a positive effect on mathematical reasoning ability. It has been revealed that teachers are also of the opinion that intelligence games will positively affect mathematical skills (Alkaş Ulusoy et al., 2017; Kel & Kul, 2021). Consistent with these studies, Erdoğan, Eryılmaz et al. (2017) concluded that intelligence games have potential for teaching mathematical concepts.

However, science teaching and intelligence games are compatible with each other in terms of curiosity, generating various solutions to problems and looking at things from different perspectives. Numerical and verbal materials used with intelligence games especially enable students to explore, generate solutions to a problem and try different ways (Bottino et al., 2007). Moreover, in line with these features, the middle school science curriculum (MoNE, 2018) has specific objectives such as finding solutions to the problems encountered in the relationship between humans and the environment, developing reasoning ability, scientific thinking habits and decision-making skills by using socio-scientific issues.

Despite these close relationships, it is seen that the number of studies on the application of intelligence games in science courses is limited. Kurupınar et al. (2022) took the opinions of science, pre-school and primary school teachers about the use of intelligence games in science teaching and found that teachers saw intelligence games as an educational tool in science teaching; however, most of them did not receive any training on intelligence games. In their study, Çetin and Özbuğtu (2020) questioned the opinions of pre-service science teachers about the use of intelligence games in science teaching after the studies in which intelligence games were introduced practically, and it was revealed that they expressed positive opinions in a positive direction. Yükseltürk et al. (2022) questioned the opinions of a group of pre-service teachers about the educational applications of intelligence games in their study focusing on the digital play of intelligence games. There were no pre-service science teachers in the study group. However, the pre-service classroom teachers in the study group revealed that they had the view that intelligence games were more compatible with mathematics lessons.

The positive views of pre-service teachers regarding the educational use of intelligence games are important for them to develop positive attitudes. However, it may be more appropriate to focus on the opinions of pre-service teachers in situations where they focus on the instructional applications of intelligence games, rather than examining the impact of beliefs and attitudes towards educational use based on practices based on learning and experiencing intelligence games. Can (2020) examined the inhibiting and supporting factors that may form the basis of pre-service teachers' attitudes towards the instructional use of intelligence games. In this study, which was conducted on classroom teachers, pre-

service teachers were trained on how to integrate intelligence games and teaching, and they were asked to associate an intelligence game of their own choice with a course, learning domain and outcome of their choice and to associate it with the learning and teaching process of a primary school level course.

Aim of Study

In this regard, it was thought that there was a need to determine the content of the science education curriculum integrated with intelligence games to be developed for teachers and teacher candidates, by focusing on the hindering and supportive factors of integrating different intelligence games into science teaching. In this study, it was aimed to determine the views of pre-service science teachers on the use of different intelligence games in science teaching. In addition, the general views of pre-service teachers on the integration of intelligence games with science teaching were also examined.

Method

Research Design

This research is a qualitative study designed with a case study design. Case study is one of the studies which intertwined with life and in which the researcher has the least influence from the outside in a way, and also it enables to investigate the research subject in depth by applying to many data sources (Gürbüz & Şahin, 2017). In case studies, it is generally aimed to reveal and interpret perceptions about a situation (Yıldırım & Şimşek, 2016:289- 291).

Study Group

The study group of the research consists of 19, second-year science teaching undergraduate program students who are studying at the faculty of education of a university in the Marmara region in the fall semester of the 2020-2021 academic year and who voluntarily agreed to participate in the study. The study group was determined by criterion sampling, one of the purposeful sampling methods. The reason for the second-grade science teacher candidates in the study group was that they did not take courses that could cause them to develop resistance due to classroom management variables or pedagogical content knowledge, and that they were taking the field Teaching Principles, Methods and Techniques course, which was thought to support the plans they were expected to develop within the scope of the study.

Process

In the case study process, a 6-week seminar was planned by the researchers based on the Ministry of National Education's Mind and Intelligence Games Curriculum for Secondary Schools (MoNE, 2013) and implemented to the pre-service teachers by the researcher who had previously received a Mind and Intelligence Games Trainer Training certificate. The procedures before, during and after this seminar process are schematized in Figure 1.

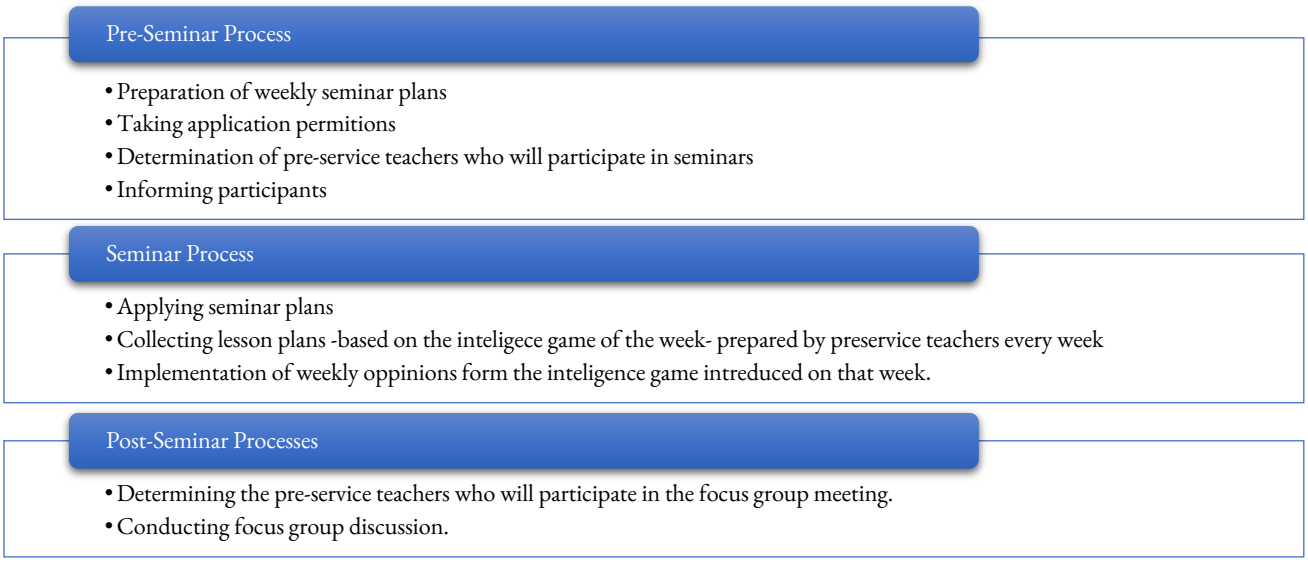

Figure 1. Case study process diagram

As shown in Figure 1, weekly seminars were first planned. First, the intelligence games to be introduced in the seminar were determined. In determining the intelligence games, the criteria of being applicable in the classroom environment with few materials and being easy to adapt to the science course were used. From the category of reasoning and processing games, four games were determined as 'Alphabet Linking' (Week 1), 'Magic Pyramid' (Week 2), 'Futoshiki' (Week 3) and 'Kendoku' (Week 5), while two games were determined as 'Anagrams' (Week 4) and 'Missing Words' (Week 6) from verbal games, making a total of six intelligence games. Seminar plans consisting of four parts were prepared for teaching the games to pre-service teachers. The seminars prepared with the direct teaching approach consisted of a) introduction of the game including the purpose and rules b) playing under the guidance of the teacher c) playing an example of the game adapted to science subjects independently d) training on game development as an integrated subject area. A sample seminer plan was given in Appendix 1.

After the preparation of the seminar plans, the process of obtaining ethical approval and application permissions from the ethics committee of the graduate education institute of the university where the application will be carried out was started. Ethical approval and application permission were obtained with the decision of the board dated 04/12/2020 and numbered 06/02. The seminar was announced to the target participant group and volunteer participants were informed in detail about the research process.

The application was carried out online through the application used by the relevant faculty of education in the distance education process in the Fall semester of the 2020-2021 academic year (which fell into Covid-19 pandemic duration). All seminars were recorded with the permission of the preservice teachers. The seminars lasted 20-30 minutes as planned. The Figure 2 and Figure 3 contain the a few screen shots from the online seminars.

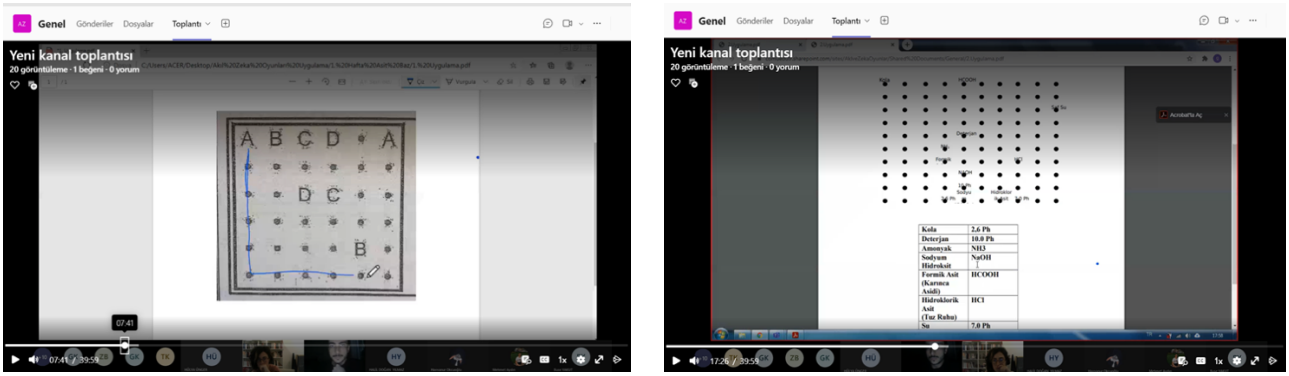

Figure 2. Screen shots from the seminar in which alphabet linking was introduced

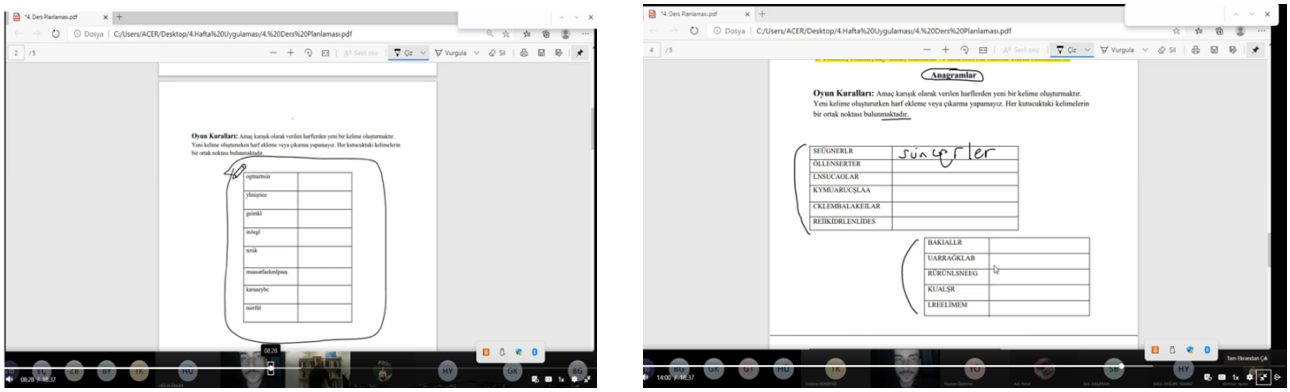

Figure 3. Screen shots from the seminar in which anagrams was introduced

At the end of the seminar, each week, the pre-service teachers were asked to choose a learning outcome suitable for the science course, make a lesson plan accordingly and use the intelligence game they had learned in the seminar in these lesson plans. In this way, it was ensured that the pre-service teachers had an experience on the use of intelligence games in science teaching. The pre-service teachers filled out an opinion form about the plan they developed until the next seminar and the weekly intelligence game application and submitted it to the researchers via the online application platform.

After the seminars were completed, the lesson plans prepared by the teachers were examined and the participants of the focus group interview were determined from the pre- service teachers who prepared lesson plans with different qualities and eight pre-service teachers were invited for the focus group interview on a voluntary basis. All the invited pre-service teachers volunteered to participate in the interview. With the participation of both pre-service teachers and the researchers, the focus group interview was conducted through the online application. During the focus group interview, pre-service teachers' opinions were obtained through a semi-structured interview form. The interview lasted 1 hour, 15 minutes and 53 seconds and was recorded.

Data Collection Tools

Opinion forms about the weekly intelligence games application and focus group interview form were used as data collection tools in this research. Opinions about the weekly intelligence games application form consists of three open-ended questions (Appendix 2) aiming to reveal the opinions of pre-service teachers about the application in science teaching of the intelligence games they have learned in that week's seminar and its possible effects on students and science teachers. The draft form was shared with an academician who is an expert in the field in terms of language and expression. Corrections were made in the statements by considering the opinions of the expert. And also, a semi-structured interview form was prepared for the focus group interview (Appendix 3). In this form, it was tried to determine the supportive and obstructive views of pre-service teachers regarding the use of intelligence games in science teaching. Expert opinion was also taken for this form.

Data Analysis

The data obtained from the opinion forms about the weekly intelligence game application were subjected to content analysis and the data obtained from the focus group interviews were subjected to descriptive analysis. Content analysis is an approach that investigates the truth by classifying expressions according to their meanings and making inferences (Tavşancıl & Aslan, 2001). Opinion forms about the weekly intelligence game application were analyzed one by one and codes were created. The coding process was done manually by the researcher. In addition, common categories were determined from these codes. The number of pre-service teachers who preferred the codes (frequency) was analyzed and tabulated. The focus group interview was first transcribed and then analyzed by descriptive analysis. Descriptive analysis is the method of first determining the themes while presenting the data and then presenting them by establishing relationships between these themes (Yıldırım & Şimşek, 2016:239-241). The data obtained from the focus group interview were presented in relation to the categories that emerged in the content analysis of the data obtained from the opinions about the weekly intelligence game application forms.

Validity and Reliability

In qualitative research, validity is defined as the attempt to assess the accuracy of the findings made by the researchers and it is recommended that researchers engage with at least two of the existing 'validity strategies' for this assessment (Creswell, 2013). In this study, rich description and external moderation were utilized as validity strategies. While presenting the findings, it was tried to be exemplified with as many quotations as possible.

For reliability, inter-coder consistency was checked. Reliability generally refers to the stability in the responses of more than one coder (Creswell, 2014). In this study, codes and categories were first extracted by one researcher. The other researcher analyzed some of the data on her own. It was seen that the codes obtained by the researchers were common. Subsequently, the researchers categorized and presented all codes with common decisions.

Findings

Preservice teachers' views on the use of different intelligence games in science teaching

In this study, the views of pre-service science teachers on the use of different intelligence games in science teaching were also examined. For this purpose, pre-service science teachers' opinions were analyzed for each intelligence game and positive and negative aspects codes were obtained. The frequency table of the obtained codes for all games is given in Table 1.

Table 1. Content analysis of preservice teachers' opinions about the educational aspects of different intelligence games used in science education

	Codes	Alphabet Linking	Magic Pyramid	Futoshiki	Anagrams	Kendoku	Missing Words	Total
PA	Increases retention	7	12	7	8	5	8	47
	Convenient	4	11	7	9	5	14	46
	Reduces workload	4	9	6	8	6	7	40
	Enjoyable	5	3	6	6	-	4	24
	Student development	4	2	-	4	6	3	19
	Facilitates learning	-	-	8	4	-	-	12
	Draws attention	4	7	-	-	-	-	11
	Ease of evaluation	2	-	-	-	-	-	2
	Increase participation	-	-	-	-	-	2	2
NA	Increase workload	4	1	3	1	8	5	22
	Usage limited	1	1	5	2	10	1	20
	Difficult	-	-	-	-	7	-	7

PA: Positive aspects **NA**: Negative aspects

As seen in Table 1, for each game introduced to them, pre-service teachers stated that intelligence games would increase retention in science teaching and that they could be used for science teaching. In addition, it was believed that for most of the pre-service teachers' other than Kendoku, the other games would make lessons enjoyable. They also stated that they would improve learning, facilitate learning, and attract attention. Although fewer than the positive opinions, it is seen that there are also negative opinions about intelligence games. It is seen that they stated that they would increase the workload, that the science subjects they can be applied to are limited and that they are difficult to use in science teaching. While the magic pyramid game received the most positive comments, Kendoku received the most negative comments.

When Table 1 is examined, it is understood that the majority of the pre-service teachers stated that intelligence games increase retention in the weekly interview form. As can be seen, pre-service teachers stated that all of the games introduced would increase retention:

> *"The student's enjoyment of intelligence games leaves a mark on the student in learning the concepts learned in the lesson more quickly and making them permanent." (Teacher10, opinion for Alphabet Linking)*

> *"I think that the intelligence game we learned this week can be used for more information (reminder) level questions in science teaching. It will be especially useful in reinforcing memorize topics. It can provide morepermanent and easily understandable learning."(Teacher3, opinion for Magic Pyramid)*

> *"Lettering the concepts will help them retain the concepts in their minds. They will be able to better comprehend the concepts that we separate as big and small."(Teacher16, opinion for Futoshiki)*

> *"There may be some conceptual words, I think it is a good way to keep these conceptual words in mind" (Teacher11, opinion for Anagrams)*

> *'When we apply the intelligence game called Kendoku to the acquisitions in science teaching, I think that if it is applied in subjects such as sorting subject-based acid base pH forces towards acidity, finding and sorting the densities of substances in density, etc., the students will keep the order in their minds in a schematized and correct way."(Teacher2).*

> *"It can be effective in teaching concepts in science education. This application facilitates the retention of Latin words with scientific content and gives the opportunity to practice." (Teacher4, opinion for Missing Words)*

Based on examination on opinions of pre-service teachers, it is understood that they generally think that it increases retention because it allows learning by doing and experiencing. Teacher6, Teacher2 and Teacher4 especially emphasize that it increases retention because students have the opportunity to practice the subject themselves. Teacher3 and Teacher11, on the other hand, mentioned that using it at the recall level, that is, in situations requiring memorization,

would increase retention. It is understood that Teacher 10 thinks that the intelligence games increases retention because it makes the lesson enjoyable for the students and allows them to enjoy it.

Another view that pre-service teachers expressed at a high rate about intelligence games is that intelligence games are useful for science teaching. Moreover, pre-service teachers expressed this view for all games. Some of the opinions of pre-service teachers in this direction are presented below as examples:

"It can be used very well and comfortably during the lesson. Depending on the place, we can prepare very good games on science subjects and apply them in our teaching life." (Teacher8, opinion for Alphabet Linking),

"Since the activity is suitable for many subjects, it can be used in most lessons." (Teacher5, opinion for Magic Pyramid)

"I think it can be used easily in many subjects. When students make comparisons on any subject, they can both repeat the subject while sorting from big to small, and their thinking skills will be improved with this application." (Teacher3, opinion for Futoshiki)

"Even if it is not used in every subject, it can be preferred in some subjects (usually subjects that involve numbers or sequences). It does not necessarily have to be numbers, but I think it is more usable in those subjects." (Teacher9, opinion for Futoshiki)

"The use of the intelligence game I learned in science teaching provides many advantages. It is useful for handling difficult subjects in an easy way."(Teacher6, opinion for Anagrams)

" I think this intelligence game is an application that will be very useful in subjects that have a sequential relationship between them." (Teacher14, opinion for the Kendoku)

"Since there are a lot of concepts in science lesson, it is a game that can be used a lot in this lesson."(Teacher5, opinion for Missing Words)

"I think this intelligence game can be used in almost every subject of our lesson because it is very easy to apply. It can be used to teach concepts in every subject."(Teacher7, opinion for Missing Words)

As can be understood from the quotations and Table 1, pre-service teachers think that all intelligence games can be easily used in science teaching. However, it is understood that they find Missing Words the most suitable for science teaching. Missing Words, which is a verbal game, is considered appropriate for teaching the concepts in the science course, and Teacher 5, Teacher 7 and Teacher 8 clearly stated this.

Pre-service teachers state that when the teacher uses intelligence games as activities or measurement tools in science teaching, this will make the teacher's job easier as it will lead to easier learning for students.

Pre-service teachers stated that all other games, except Kendoku, would make the lesson fun.

"I think it would be nice to make the lesson fun with games by using the Alphabet linking game in science lessons." (Teacher15, 'Opinion for Alphabet Linking intelligence game) '...the teacher will analyze how well the concepts are learned, go back to the places where they are not learned and have a fun and productive time with her students at the same time.' (Teacher17, opinion for the Magic Pyramid)

"The lesson becomes more enjoyable for the student. When the game is mentioned, the student looks forward to the game and listens to the subject with his/her ears, which is a very good situation for both the student and the teacher." (Teacher8, opinion for Futoshiki)

"Students understand the subjects with more concepts more fun, better and permanently. Students can be less bored in the lesson with this application."(Teacher9, opinion for Anagrams)

"Although the students have a little difficulty in the first words of the game, they will solve it quickly afterwards. This game will be both enjoyable and instructive for them."(Teacher7, Opinion for Missing Words)

As can be seen in the quotations, it was mentioned that it would provide pre-service teachers with the opportunity to develop different skills such as reasoning and self-evaluation apart from learning the subject. As shown in Table 1, Kendoku is the intelligence game that pre- service teachers most frequently stated that it develops students. In addition, some pre-service teachers also stated that the Intelligence games they knew would facilitate learning and attract students' attention:

"The mind and intelligence game that I learned in this course is a successful method to learn easily about the subjects that have a relationship of magnitude and minuteness between them." (Teacher 1, opinion for Futoshiki)

"The intelligence game that I have learned in this course includes reason and logic in science teaching. It makes it easier for them to learn the subject by grasping their logic."(Teacher6, opinion for Kendoku)

"Inconnections with the subject, if we use intelligence games in our lessons we can attract students' attention and interest to the lesson." (Teacher18, opinion for Alphabet Linking)

Kids' interest in the lesson will increase, they will make an effort to understand the lesson in order to be successful in the given games and they will make an effort to listen to the lessons. (Teacher10, opinion for the Magic Pyramid)

While T1 and T6 mentioned that the games would facilitate learning, T18, T10 and T13 stated that the games would attract students' attention. In addition, as shown in Table 1, several teachers also mentioned that they facilitate assessment and increase participation in the lesson as positive features of intelligence games. Although not as many as these positive views, pre-service teachers also expressed negative views about intelligence games. It is understood that some pre-service teachers think that Intelligence games will increase the workload of the teacher:

"The teacher and the student will have a mutual workload because the teacher will prepare the questions and the student will benefit the teacher with the knowledge of the subject in the following subjects." (Teacher11, opinion for Alphabet Linking)

"I think that the games we prepare now will increase the teacher's workload because preparing the games requires a lot of effort and a significant preparation is needed beforehand. The advantage can be during the lesson and on the students."(Teacher8, Futoshiki)

"It is difficult for teachers to prepare. When it is given to a student as an assessment, it can be evaluated in a difficult way."(Teacher12, opinion for Futoshiki)

"It is a type of game that will increase the workload. It is really difficult to prepare the game and adapt it to the subjects."(Teacher8, opinion for Kendoku)

"..... applying it to every subject requires thinking, I think that it will take students a long time and take time from the lesson in terms of the application in the lesson."(Teacher 1, opinion for Kendoku)

The preservice teachers stated that all the intelligence games introduced to them would reduce the teacher's workload. However, there is no consistency among these opinions. Magic pyramid, Anagrams and Missing Words were the three games that were positively consistent in terms of reducing workload.

'Since the activity is fun, it will have a great effect on the functioning of the lesson. Since it is an activity that will increase the participation and attention of the students in the lesson, the teacher's job will be easier."(Teacher5, opinion for Magic Pyramid)

"Intelligence games play an important role in the development of students such as thinking skills and logical reasoning. In addition, these games will increase the motivation and concentration of the students to the lesson, which provides convenience for the teacher in the teaching of the lesson." (Teacher3, opinion for Anagrams)'

"The application of the intelligence game I learned in science teaching makes it easier for teachers to explain the lesson. They can apply it when they want to do an activity. It can reveal more permanent solid learning and teaching. It will lighten their workload more."(Teacher6, opinion for Missing Words)

For the Alphabet Linking Game, there is no consistency among the opinions. As seen in Table 1, the pre-service teachers were not in agreement about the effect of the Alphabet Linking Game on the teacher's workload; some stated that it would decrease, some stated that it would increase and some stated that it would have no effect on the teacher's workload. However, for the Kendoku game, the majority of the pre-service teachers stated that it would increase the teacher's workload. It is understood that other negative opinions are also directed towards the Kendoku game. Some pre-service teachers criticized the Kendoku game on the grounds that the subjects they can use in science teaching are limited and that it is difficult to apply in science teaching:

"It is *a game with a very limited area of use." (Teacher8, opinion for Kendoku)*

"I think it can be used for very few things. It's a complicated game. It can be used in 1-2 subjects at most. It was difficult to adapt the subject to the game."(Teacher9, opinion for Kendoku)

"I think it is a difficult game to use because I think it will be difficult to find a topic that can be used with this game." (Teacher11, opinion for Kendoku)

Kendoku is the only game that pre-service teachers found difficult to use in science teaching. After the Kendoku game, Futoshiki is the other game that teachers expressed negative opinions by stating that the science subject that can be applied is limited:

"I think it is a more restricted game in terms of subject compared to the other games we have done." (Teacher12, opinion for Futoshiki)

"I think it is not a very useful application, the number of subjects to be adapted is limited" (Lecturer13, opinion for Futoshiki)

In line with these opinions, the pre-service teachers emphasized the supportive factors of the Magic Pyramid, Anagram and Missing Words games more, while the Kendoku game was the game that the pre-service teachers emphasized the most on the hindering factors due to its difficulty, lack of fun and negative effects on workload. Futoshiki game, on the other hand, was found to be inappropriate in terms of content with science lessons.

General opinions of preservice teachers on the use of intelligence games in science teaching

The general opinions of pre-service teachers about the use of intelligence games in science teaching were obtained by analyzing the data obtained from the focus group interview conducted after the training seminars. It was seen that these opinions were consistent with the opinions stated for different intelligence games and the positive effect on retention was emphasized first. Regarding this situation, pre-service teachers expressed the following opinions in the focus group interview:

"... when students do intelligence game activities, they learn without getting bored and the retention of the subjects is longer. You know, they do not forget quickly. In addition, in some of our games, we did schematization and grouping activities. If we apply them in these acquisitions, students can learn grouping more easily. I think this way in such acquisitions such as the classification of living things."(Teacher2)

" For example, there, since the student will try more than one way, he will use the words continuously until he finds the right way and I thought it would be more memorable and I think it is useful in providing attention

and visual intelligence."(Teacher14)

"First of all, because there are so many concepts in science education, I think these games are much better. Because we always use words in these games. Because they always focus on the words, you know, we always associated something with that word in their minds, you know, for example, we said a word, for example, 'a', for example, in the game, he tried to find that a, for example, so in my mind, involuntarily, that is, even if they did not want to, those words and concepts could always stay in the minds of the students. That's why I think it can be used. That's how it is."(Teacher16)

In the general opinions of pre-service teachers on the use of Intelligence games in science teaching, fun and increasing interest were another supportive factors emphasized.

"...I generally used it in systems or sequential subjects, mostly for them to understand the location of concepts. I mean, I used it mostly for them not to confuse, to memorize correctly."(Teacher7)

Most pre-service teachers mentioned that regardless of the intelligence game used, intelligence games would increase students' interest in the lesson and make the lesson more fun and contribute to both having fun and learning. Student 7 mentioned this issue in the focus group interview as follows:

"Teacher, actually, the student looks at it like a game, that is, he looks at it like a game. I mean, he has fun, but at the same time I think he learns without realizing it."(Teacher7)

Finally, the pre-service teachers mentioned that the subject area in which some intelligence games can be used in science teaching is limited and therefore their usefulness decreases. When Table 1 is examined in relation to this issue, it is seen that the game that the pre-service teachers stated quite a lot of opinions on this issue is the 'Kendoku' intelligence game. The pre-service teachers also mentioned the limitation of the science subjects that can be applied in the adaptation of intelligence games in the focus group interview in Kendoku as follows:

"... I can't remember the name of it, but we made a table and there were different sections in the shape of a square. It was indicated with lines. I had a little difficulty in this game, there was a game that was something like one plus two. I had a hard time preparing that game. I mean, I couldn't find a topic. Even though I found a topic, I got a little confused about how to do it. That's what happened."(Teacher7)

-"How should I say it, I mean, it was quite complicated for the student to be able to do the operations there, or to distinguish the pH of the substances, or to understand the implementation of that activity. For example, I would not make them apply it, teacher."(Teacher10)

The general opinions of preservice teachers regarding the use of intelligence games in science teaching are consistent with the views stated for different intelligence games and the positive effect on performance

Discussion and Conclusion

In this study, pre-service science teachers' views on the application of different intelligence games in science teaching were examined. During the research, six games were introduced to pre-service science teachers for six weeks, one game per week. Each week, pre-service science teachers were asked to prepare a lesson plan in which they used the intelligence game introduced that week in science teaching, thus providing them with a design experience. Data were collected through opinion forms filled out for each game. At the end of the study, a focus group interview was conducted and the opinions of pre-service science teachers about the application of intelligence games in science teaching in general were examined.

As a result of the research, it was observed that pre-service teachers' views on different intelligence games differed and the emphasis on supportive and obstacles factors varied from game to game. Preservice teachers' views on the supportive factors of the use of Intelligence games in science teaching are largely in agreement on learning and their effects on

students. The pre- service teachers emphasized the positive effects of intelligence games such as learning concepts, increasing retention, and supporting student development both on the basis of games and in general.

When the literature is examined, it is seen that there are studies that have reached the results that intelligence games increase success (Bottino & Ott, 2006; Demirel, 2015; Orak et al., 2016) and increase creativity (Ott & Pozzi, 2012). In this study, it was determined that pre-service teachers believed the use of intelligence games in science teaching would increase the retention of what was learned. In addition, pre-service teachers stated that Intelligence games would develop students and facilitate their learning. In line with this finding, there are studies that found that pre-service science teachers stated that intelligence games will improve students (Çetin & Özbuğtu, 2020; Savaş 2019). Kurupınar et al. (2022) reported that teachers believed intelligence games would increase the retention of what was learned in science lessons.

However, there are different game-based opinions about the effect of intelligence games on learning and learning-teaching process. Pre-service science teachers reported that the use of Alphabet Linking and Magic Pyramid games in science teaching would increase students' attention to the lesson. In addition, the pre-service science teachers of the games other than Kendoku also stated that intelligence games would make the lessons fun.

The opinions of pre-service teachers differ from game to game in terms of teacher workload and use in science lessons. While most of the pre-service teachers emphasized that the Magic Pyramid, Anagram and Missing Words games would reduce the teacher's workload by focusing on facilitating learning, they could not reach a consensus on this inhibiting factor in the Alphabet Linking game. Kendoku came to the forefront with inhibiting factors in terms of both increasing the teacher's workload and adaptation difficulty to science content. Futoshiki game was also evaluated as incompatible with science content. Kurupınar et al (2022) also stated that teachers had difficulties in associating science subjects with intelligence games in their research in which they examined teachers' views on intelligence games in general. The views of pre-service science teachers in this study on the application of intelligence games in science teaching in general also support the findings of Kurupınar et al (2022).

The results of this study reveal that the perception of supportive and inhibitory factors related to the use of intelligence games in science teaching changes depending on the selected intelligence game. Teachers' and pre-service teachers' perceptions of inhibiting and supporting factors should be considered as the source of their attitudes towards the use of Intelligence games in science teaching. In this direction, it reveals that teacher educators who aim to train teachers and pre-service teachers on the use of intelligence games in teaching should be careful in game selection. Otherwise, teachers may avoid using intelligence games in science teaching due to their negative attitudes.

Recommendations

In this direction, it can be suggested that the Magic Pyramid and Missing Words games should be included in the education to be given to pre-service science teachers and teachers on the use of intelligence games in science teaching, and Kendoku game should not be included. However, this study is limited to six intelligence games. Determining appropriate games with similar studies and creating a game content pool will be contributory for science teacher educators. Similar studies can be conducted on the use of Intelligence games in different teaching subjects.

In addition, similar studies can be conducted with teachers and preservice teachers who are at the stage of completing their teacher education to examine the effect of pedagogical content knowledge on teachers' perceptions of inhibiting and supporting the use of intelligence games in science teaching. Thus, clues can be obtained about at which stage of teacher education these, and similar educational initiatives will be effective.

Acknowledgement

Contributions of the Researchers; All authors contributed to the manuscript equally. Financial Support; The authors declared that this research received no specific grant from any funding agency in the public, commercial, or not-forprofit sectors. Conflict of Interest; The authors have disclosed no conflict of interest. Ethical Committee Permissions; In this study, all rules stated to be followed within the scope of "Higher Education Institutions Scientific Research and

Publication Ethics Directive" were followed. None of the actions stated under the title "Actions Against Scientific Research and Publication Ethics", which is the second part of the directive, were not taken. The study was approved by the Çanakkale Onsekiz Mart University Graduate Education Insttute Ethics Committee (Date: 4 /12/ 2020, Number: 06/02).

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References

Aksoy, N. C. (2014). *Dijital oyun tabanlı matematik öğretiminin ortaokul 6. sınıf öğrencilerinin başarılarına, başarı güdüsü, öz-yeterlik ve tutum özelliklerine etkisi (Effects of digital game-based mathematics teaching on 6th grades students' achievement, motivation, attitude and self-efficacy)*. Doctoral Dissertation. Gazi University, Ankara.

Alkaş Ulusoy, Ç., Saygi, E.& Umay, A. (2017). İlköğretim matematik öğretmenlerinin zekâ oyunları dersi ile ilgili görüşleri (Views of elementary mathematics teachers about mental games course). *Hacettepe University Journal of Education, 32*(2), 280-294. https://doi.org/10.16986/HUJE.2016018494

Altun, M. (2017). *Fiziksel etkinlik kartları ile zeka oyunlarının ilkokul öğrencilerinin dikkat ve görsel algı düzeylerine etkisi (The effects of the physical activity cards and braïn teasers to the attention and visual perception levels of the primary school students)*. Doctoral Dissertation. Gazi University, Ankara.

Alessi, S. M. & Trollip, S. R. (2001). Multimedia For Learning (3rd ed.), Allynand Bacon.

Arslan, A., & Dilci, T. (2018). Çocuk oyunlarının çocukların gelişim alanlarına yönelik etkilerinin geçmiş ve günümüz bağlamında incelenmesi (Sivas ili örneklemi) [Games of children's in the context of a study of the effects of past and present for development areas of childrens (sivas province sampling)]. *The Journal of Fırat University International Social Sciences,* 28(1), 47-59. https://doi.org/10.18069/firatsbed.388064

Bottino, R. M., Ferlino, L., Ott, M. & Tavella, M. (2007). Developing strategic and reasoning abilities with computer games at primary school level. *Computers and Education, 49*(4), 1272-1286.

Bottino, R. M., & Ott, M. (2006). Mindgames, reasoningskills, and the primary school curriculum. *Learning Media And Technology, 31*(4), 359-375.

Can, D. (2020). Sınıf öğretmeni adaylarının zekâ oyunlarını öğretim süreciyle bütünleştirmeye yönelik görüşleri (Views of Pre-Service Primary School Teachers' About Integration of Mind Games with Teaching Process). *The Journal of Buca Faculty of Education, 50,* 172-190.

Çağan, B. & Usta, N. (2023). Akıl ve zekâ oyunlarının ortaokul öğrencilerinin matematik başarısına etkisinin incelenmesi (Investigation of the effect of mind and intelligence games on the mathematics achievement of middle school students.) *International Academic Social Resources Journal,* 8(52), 3331-3341. http://Dx.Doi.Org/10.29228/Asrjou Rnal.71353

Creswell, J. W. (2013). *Nitel araştırma yöntemleri: Beş yaklaşıma göre nitel araştırma ve araştırma deseni* (Translation of 3rd Edition). (Bütün, M. ve Demir, S. B., Trans. Ed). Siyasal.

Creswell, J. W. (2014). *Research design: qualitative, quantitative and mixed methods approaches* (4th Edition). Sage.

Çetin, A., & Özbuğutu, E. (2020). Fen bilgisi öğretmen adaylarının akıl-zeka oyunları ile ilgili görüşleri (the opinions of pre-service science teachers about mental-intelligence games). *Dicle University The Journal of Ziya Gökalp Education Faculty, 1*(37), 93-99. http://dx.doi.org/10.14582/DUZGEF.2020.144

Demirel, T. (2015). *Zekâ oyunlarının Türkçe ve matematik derslerinde kullanılmasının ortaokul öğrencileri üzerindeki bilişsel ve duyuşsal etkisinin değerlendirilmesi* (Evaluating cognitive and affective effects of using mind games in Turkish and Mathematics courses on secondary school students) Doctoral Dissertation. Atatürk University, Erzurum.

Devecioğlu, Y. & Karadağ, Z. (2014). Amaç, beklenti ve öneriler bağlamında zekâ oyunları dersinin değerlendirilmesi (Evaluation of mind puzzle course at the context of goals, expectations and recommendations). *Journal of Bayburt University Faculty of Education,9*(1), 41-61.

Ebner, M., & Holzinger, A. (2007). Successful implementation of user-centered game based learning in higher education: An example from civil engineering. *Computers and Education, 49*(3), 873-890.

Erdoğan, A., Eryılmaz Çevirgen, A. & Atasay, M. (2017). Oyunlar ve matematik öğretimi: stratejik zekâ oyunlarının sınıflandırılması (Games and Mathematics Teaching: A Classification of Strategic Brain Games). *Uşak University Journal of Social Sciences*, 10(Erte Special Issue), 287-311. https://Doi.Org/10.12780/Usaksosbil.373867

Genç, M. (2012). Öğretmenlerin çoklu zekâ alanları ile problem çözme becerileri arasındaki ilişkinin incelenmesi (Investigating of the relation between theteachers' multiple intelligences and problem solving skills). Bartın University Journal of Faculty of Education, 1(1), 77-88.

Gürbüz, S., & Şahin, F. (2017). Sosyal bilimlerde araştırma yöntemleri (Research in Social Sciences) (4th Edition). Seçkin..

Kel, S., & Kul, B. (2021). Akıl ve zekâ oyunlarının öğrencilere katkıları: eğitmenlerin görüşleri (The Contribution of Mind and Intelligence Games to Students: Views of Instructors) International Journal of Science and Education, 4(3), 207-225. https://Doi.Org/10.47477/Ubed.840868

Kurupınar, A., Yüksel, İ., & Kurt, H. (2022). Views of secondary school science, pre-school and primary school teachers on science education with intelligence games. *International Journal Of Education And Literacy Studies*, 10(1), 48-57.

Li, M. C., & Tsai, C. C. (2013). Game-based learning in science education: Areview of relevant research. *Journal of Science Education and Technology*, 22, 877–898.

Ministry of National Education of Türkiye (MoNET) (2016). Ortaokul ve imam hatip ortaokulu zekâ oyunları 5, 6, 7 v e 8. Sınıflar: Öğretmenler İçin Öğretim Materyali. (2. baskı). Devlet Kitapları.

Ministry of National Education of Türkiye (MoNET) (2013). Ortaokul ve İmam Hatip Ortaokulu Zekâ Oyunları Dersi Öğretim Programı (5, 6, 7 ve 8. Sınıflar) [Elementary School Intelligence Game Teaching Program (5th, 6th, 7th and 8th Grades)]. Retrieved from https://mufredat.meb.gov.tr/Dosyalar/202152512057724-zeka_oyunlari.pdf.

Ministry of National Education of Türkiye (MoNET) (2018). Fen Bilimleri dersi öğretim programı (ilkokul ve ortaokul 3., 4., 5., 6., 7., ve 8. Sınıflar) [Science Teaching Program (Primary and Elementary 3rd, 4th, 5th, 6th , 7th and 8th Grades]. Retrieved from https://mufredat.meb.gov.tr/Dosyalar/201812312311937-FEN%20B%C4%B0L%C4%B0MLER%C4%B0%20%C3%96%C4%9ERET%C4%B0M%20PROGRAMI2018.pdf

Myers, R.D. & Reigeluth, C.M. (2017). Designing games for learning. C.M. Reigeluth, B.J. Beatty, R.D. Myers (Eds.), *Instructional-design Theories and Models. The Learner-Centered Paradigm of Education,* Routledge, New York, NY (2017), pp. 205-242.

Orak, S., Karademir, E. ve Artvinli, E. (2016). Orta Asya'daki zekâ ve strateji oyunları destekli öğretime dayalı uygulamaların akademik başarıya ve tutuma etkisi (The effects of intelligence and strategy games in central asia-supported mathematics learning achievement and attıtude). *Eskişehir Osmangazi Üniversitesi Türk Dünyası Uygulama ve Araştırma Merkezi (ESTÜDAM) Eğitim Dergisi,* 1(1), 1-18.

Ott, M., & Pozzi, F. (2012). Digital games as creativity enablers for children. *Behaviour ve Information Technology, 31*(10), 1011-1019.

Prensky, M. (2008). Students as designers and creators of educational computer games: who else? *British Journal of EducationalTechnology,* 39(6), 1004-1019.

Savaş, M. A. (2019). *Zekâ Oyunları eğitiminin fen bilimleri öğretmen adaylarının eleştirel düşünme becerileri üzerine etkisi. (The effects of intelligence games education on prospective science teachers' critical thinking skills).* Master's Thesis, Bartın University, Bartın.

Tavşancıl, E. & Aslan, E. (2001). *Sözel, yazılı ve diğer materyaller için içerik analizi ve uygulama örnekleri (Content analysis and application examples for verbal, written and other materials).* Epsilon.

Uzun, L., Çetinavci, U. R., Korkmaz, S. & Salihoglu, U. M. (2013). Developing and applying a foreign language vocabulary learning and practicing game: the effect of vocaword. *Online Submission*, *5*(1), 50-70.

Yazıcıoğlu, S., & Çavuş Güngören, S. (2021). Game-based activities related to light and sound unit and students views. *Journal of Inquiry Based Activities, 11*(1), 51–68.

Yazıcıoğlu, S., & Çavuş Güngören, S. (2019). Investigate the effect of game-based activities on middle school students' science learning according to achievement, motivation, attitude and gender variables.*Necatibey Faculty of Education Electronic Journal of Science and Mathematics Education,13*(1), 389–413.

Yıldırım, A. & Şimşek, H. (2016). *Nitel Araştırma Yöntemleri (Qualitative Research Methods).* Seçkin..

Yöndemli, E. N. & Taş, İ. D., (2018). Zekâ oyunlarının ortaokul düzeyindeki öğrencilerde matematiksel muhakeme yeteneğine olan etkisi (The effect of intelligence games on secondary school students' mathematical reasoning skills). *Turkish Journal Of Primary Education, 3*(2), 46-62.

Yükseltürk, E., Ilhan, F., & Altiok, S. (2022). Preservice teachers' views about the use of mind and intelligence games in education. *Participatory Educational Research*, *9*(6), 398-417.

Appendix 1. A Sample Seminar Plan

1st Week
The Intelligence Game Introduced: Alphabet Linking
Time Duration: 20-30 minutes
Seminar Flow
Enter the Microsoft Teams Application. After a brief acquaintance with the teacher candidates, they are asked, "Does anyone know what intelligence games are and what they involve?" If there are pre-service teachers who have experienced it before, their opinions are taken. For pre-service teachers who have not experienced it, intelligence games are briefly mentioned.
The game of the first week, Alphabet Linking, is briefly introduced to them by using the screen mirroring feature. After the rules of the game are explained, how to play the game and illegal moves are shown with the help of the pen used in screen projection. During the process, the game is completed by combining the clue questions directed to theparticipants by the researcher and their feedback; so that the answer key is created. This concludes the first stage of the seminar.
In the second stage, the Alphabet Linking game adapted to science is briefly explained and pre-service teachers are given 5-10 minutes to do this activity in Microsoft Teams. For students who cannot complete it after the deadline, the answer key is projected on the screen so that all of them can access the answer key.
As the last stage, teacher candidates are given information about how to design this game and how to adapt it to science. The opinions about the weekly intelligence games application for Alphabet Linking is sent to teacher candidates by e-mail. In addition, teacher candidates are asked to use the Alphabet Linking Intelligence game they learned this week in a science lesson plan prepared to reach an approprite outcome present in science curriculum.

Appendix 2. Opinions about the weekly intelligence games application form

Semi-structured Interview Questions

Q1. What do you think about the usability in science teaching of the intelligence game that you have been learned in this course?

Q2. What effect do you think the application in science teaching of the intelligence game you have been learned in this course will have on the student?

Q3. How do you think the application in science teaching of the intelligence game that you have been learned in this course will affect the workload of teachers?

Appendix 3. Semi-structured Focus Group Interview Form

Focus Group Interview Form Questions

Q1. What are your thoughts about the application of intelligence games in science teaching?

a. What are their advantages?

b. What are their disadvantages?

Q2. For what purposes should intelligence games be used in science classes, at which stages of the learning and teaching process? Why?

Q3. What suggestions would you give to teachers or pre-service teachers who will use intelligence games in science teaching?

a. For what subjects should they use intelligence games?

b. For what purposes should they use intelligence games?

c. What should they pay attention to when preparing intelligence games for science teaching?

Journal for the Education of Gifted Young Scientists, 12 (2), 63-82, June 2024
e-ISSN: 2149- 360X
jegys.org
dergipark.org.tr/jegys

Young Wise Publishing
youngwisepub.com
gencbilgeyayincilik.com

Research Article

Systematic analysis of postgraduate theses on feedback in educational processes in Türkiye

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Article Info

Received: 31 May 2024
Accepted: 30 June 2024
Available online: 30 June 2024

Keywords
Content analysis
Feedback
Feedback in educational processes
Postgraduate theses

Abstract

Feedback has always been an important element of learning-teaching processes and has always been at the centre of research on this subject. In this context, a significant number of studies in the literature have examined the feedback element with different dimensions and revealed important clues on the subject. The main purpose of this study is to conduct a content analysis of the postgraduate theses on the theme of feedback from past to present in terms of subject and methodology. For this purpose, 68 theses made between 2000 and 2023 within the scope of Institute of Educational Sciences and Institute of Social Sciences programmes in state universities in Turkey were analysed. According to the results of the content analysis technique, it was determined that the theses were mostly conducted at the Master's level (n=51), the theses mostly focused on teachers' in-class feedback practices and their views on feedback, the theses were mostly in the fields of English language teaching and Computer and Instructional Technologies; limited studies were conducted on this subject within the scope of teacher education and teaching practice. The results of the research showed that new researches are needed to examine the element of. Within the framework of the results of the research, it can be suggested that different research methods should be utilized in new studies to be conducted in this subject area, especially qualitative studies should be designed to examine the subject.

To cite this article:

Çay, Y., & Çakmak, M. (2024). Systematic analysis of postgraduate theses on feedback in educational processes in Türkiye. *Journal for the Education of Gifted Young Scientists*, *12*(2), 62-82. DOI: http://dx.doi.org/10.17478/jegys.1493256

Introduction

One of the structures that form the basis of the learning-teaching process is the quality of the teaching service (Senemoğlu, 2020). According to Bloom (2016), encouragement, reinforcement, active participation, feedback and correction are the most important factors in the quality of teaching service. All these factors are critical in the educational activity. However, this current research focused on the feedback factor and feedback themed graduate thesis. Various definitions have been made regarding the concept of feedback in the relevant literature as given in some examples below:

Bruner (1974) defines feedback as an error-correction process, Ramaprasad (1983) describes it as information about how actual and target levels differ from each other. In contrast, Winne and Butler (1994: 5740) define feedback as "information that can be validated, supplemented, rewritten, adapted, or reconstructed in memory, including domain knowledge, metacognition, assumptions about self and tasks, and cognitive skills and policies" (p. 5740). Hill (1997) states that feedback is a concept taken from cybernetics and describes a process in which the response is controlled by its

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effects. Sadler (1989), on the other hand, sees feedback as the process of providing information about the difference between a performance or learning situation and the desired performance or learning situation. According to Senemoğlu (2020), feedback and correction, teaching in group learning, it is the most powerful element that determines the performance quality and the achievement level. In the classroom environment, since the students do not interact with each other at the same level, the cues, participation and reinforcement given to the students during the teaching have different meanings and, consequently, there are discrepancies between the learning levels of the students. In this case, it is a matter of determining which of the behaviours that the students are to acquire have been fully learned, which have been inadequately learned, or which have not been learned at all.

Hattie (2007) conceptualised the concept of feedback as a piece of knowledge passed on by an intermediary, a source such as a teacher, a parent, a classmate, a book, or the individual himself/herself. According to this definition, the teacher is not the sole provider of feedback. Accordingly, the teacher may provide information, the peer may provide an alternative perspective, the parent may provide support and, as a result, feedback is the outcome of a performance. Careless (2019), on the other hand, disagreed with the definition of the concept of feedback in the literature as outcome information transmitted from the teacher or any other source to the student stating that such a definition is no different from transmitting only the outcome or making a judgement on a past performance or understanding activity. Bloom (1998), who emphasised the importance of improving the quality of education and training, pointed out the role of feedback in curriculum and teaching by stating that there are four elements, namely cue (signs), participation, reinforcement, feedback and correction.

Sönmez (2015, p. 152) defined feedback as "giving information about the student's behavior" and emphasized that feedback has basic functions such as directing, motivating, reinforcing and underlined that feedback is the most important element of open systems. According to Sönmez, feedback is vital not only for obtaining consistent information about the student, but also for obtaining information about the training situations, which is one of the important elements of the training program, in this dimension, feedback checks the soundness of the training, reveals the effectiveness of the training situation and contributes to the resilience of the training.

The teacher or peers interact with each other through feedback in the teaching process. The teacher and the student are constantly exchanging in interaction. The student reacts to the teacher's message. The teacher's reactions to the message sent by the student as a reaction are feedback. The communication process is completed after the message is transmitted to the receiver with the arrival of the enlightening echo reactions in the opposite direction to the source. It becomes an evaluation phase for the student and the teacher" (Özen, 2001: 100). Feedback, which has become an important part of the teaching process and is the subject of many researches today, is encountered in almost every stage of daily work and social life. Feedbacks are important sources of information that we sometimes use for personal and institutional research and development purposes, and most of the time by inferring from our experiences without realising it (Çelikkaya & Kuş, 2010). Feedback is one of the most emphasised topics to increase performance in corporate life. Through feedback, students can learn to distinguish their successes from their mistakes and to transform their mistakes into successes (Rijlaarsdam and Couzijn, 2005); for this, they need to continuously experiment and receive correct feedback on their mistakes. The task of teachers is to continue to look for ways to make sure that each student learns during the learning process (Bloom, 1998), and to make efforts for learning to take place by providing continuous, accurate and sufficient feedback without hurting or humiliating the student. Feedback, which is one of the elements of communication, is an important source for providing information in the teaching process. Because feedback provides both the teacher and the student with the opportunity for self-evaluation by providing information about the level of learning. It helps the student to see and complete his/her deficiencies (Ergin, 2012). Feedback is also important in that it provides sufficient information about the student's current learning, it also provides guidance about what to do in the next stage and it allows students to recognise their mistakes, seek new answers and learning (Ünsal, 2002). Brown et al (2012) emphasised the importance of not only feedback but also how feedback is provided, stating that not providing feedback leaves mistakes uncorrected and achievements unreinforced, or that incorrect, inaccurate or inappropriate use of feedback can have negative effects by reducing student engagement and motivation rather than improving

performance and learning. From this perspective, it can be argued that feedback can only be effective if it is provided to students with the objectives in mind and can guide students to improve and develop their performance (Hattie, 2012; Carless, 2006; Johnson, 2006).

In this setting, this study aims to identify the research trends related to feedback theme and analyse this research according to different variables. In this context, it can be predicted that the indicators revealed by the research will make significant contributions to researchers interested in this field. In this framework, the research questions that guide the study are as follows;

- What is the distribution of feedback-themed theses by year?
- What is the distribution feedback-themed theses according to the level of graduate degree?
- What are the dimensions of feedback-themed theses?
- In which areas (English, science, mathematics, etc.) have feedback thesis been carried out?
- What are the main aims of feedback-themed theses?
- What are the main research models/approaches used in feedback-themed theses?
- What are the general characteristics (sampling techniques, sampling group, sampling level, etc.) of the population and sample of feedback-themed theses?
- What are the data collection methods and tools used in feedback-themed theses?
- What types of analyses have been used in feedback-themed theses

Method

Research Design

In this qualitative research, 68 thesis (master and doctorate) on the topic of feedback were examined in the Graduate Schools of Social Sciences (GSSS) and Gratuate Schools of Educational Sciences (GSES) of state universities in Turkey between 2000 and 2023. In qualitative research that contributes to the understanding of a situation perceived in different contexts, various analysis methods such as phenomenology, grounded theory, phenomenographic and content analysis are used (Burnard, 1995; cited in Bengtsson, 2016). Content analysis is implemented on the theses determined for this research. Content analysis is a method by which the researcher can study human behaviour without the need for direct involvement with a person or situation. This method can be utilized on printed materials (newspapers, diaries, books, etc.) or products (films, songs, poems, etc.) (Fraenkel & Wallen, 1996) and this research was conducted on theses as printed materials.

Data Collection

This study included postgraduate theses (master and doctorate) on the topic of feedback in the GSSS and GSES of state universities in Turkey between the years 2000 and 2023. In order to determine the documents of the study, firstly, a detailed search of the postgraduate theses conducted between 2000 and 2023 was made in the National Thesis Center in Higher Education Council (HEC) with the keyword "feedback". The theses obtained as a result of the initial screening were examined and the theses conducted in the GSSS and GSES of state universities were selected. In data collection, a scheme was created within the framework of the research questions. This scheme included the author, title, year of publication, theme, purpose, research method, population and sample, study area, data collection method and tools, and data analysis information of the theses to be examined within the framework of the research questions.

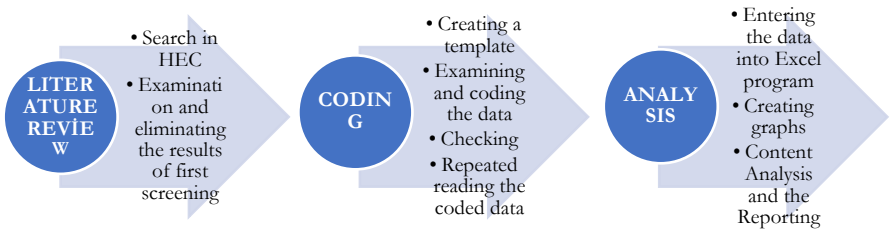
Data Analysis

Between the years 2000 and 2023, 68 theses on the topic of feedback in the GSSS and GSES of state universities in Turkey were read repeatedly, and the information obtained was processed to answer the research questions in the sheme prepared in accordance with the purpose and research questions of the study. For research questions 3 and 5, common themes were identified through repeated readings and for research questions 1, 2, 4,6, 7, 8, and 9 the information in the sheme was coded on the Excel program. As a result of this coding in the Excel programme, graphs were produced showing distribution of theses according to publication years, graduate level, study group/participants, field of study, and method. The research models, the general characteristics of the population and the sample, the data collection

methods and tools, the data analysis methods of the studies were interpreted as a result of repeated readings and examinations of both the data coded in the Excel programme and the information in the sheme created. Briefly, the content analysis process was carried out in the following stages:

- The PhD and graduate theses completed on feedback-themed were initially searched in the National Thesis Centre in Higher Education Council (HEC) with the limitaion of GSSS and GSES.
- Screening of feedback-themed theses from the National Thesis Center of the Council of Higher Education (HEC) with the limitation of GSSS and GSES.
- Creating a template within the framework of the purpose of the research and the research questions.
- Examining the theses one by one and process the data into the template.
- Repeated checking of the data processed in the template.
- Repeated reading of the data on the sheme to answer research questions (RQ-3 and RQ-5) and to identify common themes.
- Centering the data into Excel program in categories to answer the other research questions.
- Creating graphs to show the distribution of the data entered into Excel.
- Revising and finalising the template, codes, categories and themes.

As a last point, analyses were limited to the size, purpose, research model, study area, population and sample, data collection methods and instruments, and data analysis of the studies; findings, conclusions and recommendations parts of the theses were not included in the analysis. Content analysis process of this research illustrated in the Figure 1.



Validity and Reliability

Verification processes regarding the analysis phase and raw data were conducted by both the researcher and an expert, ensuring the reliability of the analysis through result comparisons. In cases where inconsistencies were observed between the researcher's and the expert's opinions, a re-examination was performed to achieve consensus. To ensure the external reliability of the study, all procedural steps were extensively presented in tables in the methodology section. Additionally, data verification processes were recorded both digitally and in print.

Results

Within the framework of the aim of this study, when the theses with feedback theme (2000-2023) were examined, it was found that 68 theses on the topic of feedback were carried out. Regarding with the first question of this research, initially, distribution of the analysed theses according to the years of publication in 5-year periods is shown in Figure 2.

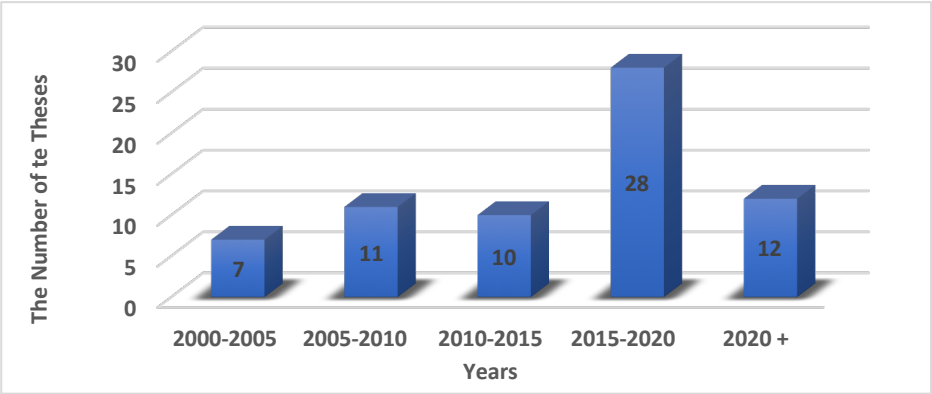


Figure 2. Distribution of the analyzed theses according to publication years

Considering the spread of the theses analysed in terms of the publication years in 5-year periods, it can be concluded that there is an increase in the quantity of studies on the subject of feedback in terms of the years. Another striking point is that feedback-themed theses were mostly made between 2015 and 2020. Another question of the research is the distribution of the theses examined in the present paper according to the level of degree. The results for this question are shown in Figure 3.

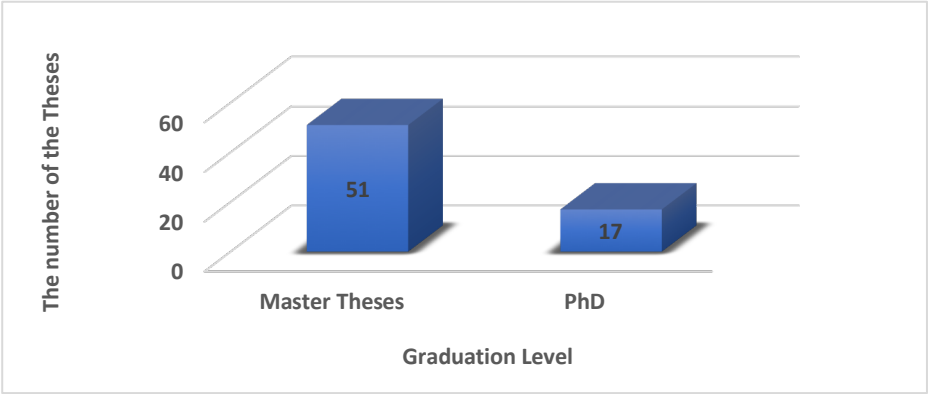


Figure 3. Distribution of the analyzied theses according to graduate level

Looking at Figure 3, it can be seen that 51 of the reviewed studies are Master's theses and 17 of them are PhD theses. Accordingly, thesis studies were mainly carried out at the master's level. Regarding with the third research question of the study, when analysing the theses with feedback theme, it is seen that the theses were grouped into four dimensions as illustarated in Figure 4.

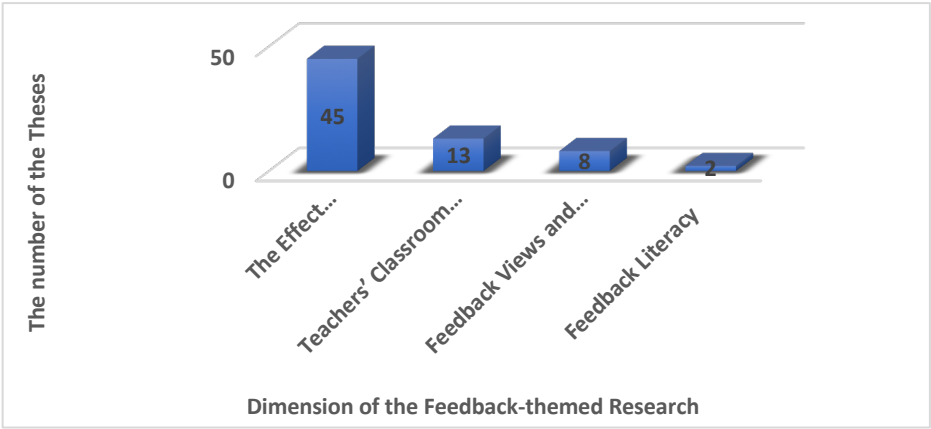


Figure 4. Distribution of the analyzied theses according dimension

The distribution of the feedback-themed theses mentioned in the Figure 4 is detailed in Table 1, and the results of the content analysis conducted for each dimension are reflected in the Table 1.

Table 1. Dimensions of feedback-themed research

Dimension	Field	Theme	Related studies
The effect /effectiveness of any type of feedback (n=45)	English Teaching (n=15)	The effect of feedback type on students' writing skills (n=13)	T4,T10,T15,T16,T29,T31,T37,T42,T44 ,T51,T53,T59, T67
		The effect of feedback on student engagement (n=1)	T68
		The corrective feedback on teaching English (n=1)	T64
	Computer and Instructional Technologies (n=13)	The effects of feedback types used in computer assisted learning enviroments on different aspects such as students' academic achievement (n=9)	T6, T12, T14, T21, T35, T39, T48, T56, T60
		The effects of an intelligent feedback system created with artificial intelligence techniques (n=4)	T28, T36, T45, T46
	Special Education (n=2)	The usage of video feedback (n=1)	T23
		The effectiveness of requesting feedback from the teacher (n=1)	T65
	Music Teaching (n=2)	The usage of video feedback (n=1)	T32
		The effect of feedback processes on teachers' frequency of using rewards (n=1)	T62
	Physical EducationTeaching (n=2)	Learner-controlled feedback planning (n=1)	T57
		Verbal feedback and its effects (n=1)	T66
	Science Teaching (n=1)	The effect of feedback-correction on studensts' learning level (n=1)	T49
	Teaching Turkish to Foreigners (n=2)	The effect of feedback on the writing skills of students (n=1)	T17
		The effect of visual feedback activities on learners (n=1)	T27
	Turkish Teaching (n=1)	The effects feedback techniques in written expressions (n=1)	T54
	Teacher Education and Teaching practicum (n=7)	The effects training program prepared for teachers on teachers' feedback skills (n=6)	T3, T6, T13, T47, T58, T61
		Effective feedback programme for improving classroom teaching (n=1)	T9
Tclassroom feedback practices and stances on the term of feedback (n=13)	English Language Teaching (n=10)	Written feedback practices (n=5)	T2, T30,T34,T38, T52
		Oral corrective feedback practices (n=5)	T8, T18,T40,T43, T63
	Primary School Teaching(n=2)	Teacher feedback practices (n=2)	T7, T50
	Science Teaching (n=1)	Teacher feedback practices (n=1)	T24
Feedback views and preferences of students (n=8)	English Teaching (n=6)	Students/teachers' preferences on the use of written feedback (n=6)	T11,T20,T22,T25,T26,T55
	Computer and Instructional Technology (n=1)	Seedback preferences of learners' in e-assessment (n=1)	T19
Feedback Literacy (n=2)	English Teaching (n=2)	Teacher feedback literacy (n=1)	T1
		Student feedback literacy (n=1)	T5

When the theses included in the content analysis within the scope of the research and conducted in the dimension of "teachers' in-class feedback practices and their views on feedback" were examined in detail, it was seen that there were theses in different fields on feedback, however, the majority of the theses examined (n=15) were in the field of English language teaching and Computer and Instructional Technologies (n=13). A significant number of feedback-orientated theses (n=7) were conducted within the scope of teacher education and teaching practice.

According to the detailed analysis of the theses in the dimension of "Teachers' classroom feedback practices and stances on the term of feedback", which was included in the content analysis within the scope of the research, it was seen that most of the theses (n=10) were in the field of English Language Teaching, similar to the first dimension. Similar to the first dimension, when the theses in the dimension of "Feedback views and preferences of students", which were included in the content analysis within the scope of the research, were analysed in detail, it was seen that the theses were in the fields of English language teaching and Computer Education and Instructional Technology.

As seen in the Table 1, according to the results of the content analysis, the last dimension was "Feedback literacy". It was determined that there were two thesis studies on this dimension. The concept of feedback literacy is a fairly new concept, and it is a concept that expresses many competences in thinking about feedback, understanding feedback, planning effective feedback practices, developing feedback strategies, and feedback (Carless & Boud, 2018). In this study, one of the theses with the theme of 'feedback literacy', which was determined based on content analysis, focused on teacher feedback literacy and the other one focused on student feedback literacy.

Another question in this research aimed at identifying the main purposes of studies on feedback. Based on the content analysis results, it is possible to list the main purposes of the studies examined in the context of this question, with a general evaluation, as follows:

- to identify the classroom feedback practices of teachers from different disciplines (e.g., Dokuzoğlu,2010; Demir, 2013; Pastakkaya, 2020; Şahin, 2006).
- to explore teachers' views on feedback (e.g., Şener, 2019; Karaağaç, 2014; Köroğlu, 2021).
- to reveal teachers' feedback practices they implement and recommend (e.g., Abdioğlu, 2019; Yavuz, 2022; Bayram, 2002; Özkale, 2018; Karaağaç, 2014).
- to identify students' feedback preferences and their views on the feedback they receive (e.g., Yılmaz, 2021; Özen, 2019; Kaya, 2019; Gümüş, 2019; Eren, 2018).
- to compare students' and teachers' feedback preferences/perceptions (e.g., Yılmaz, 2021; Yiğit, 2019; Şahin, 2006).
- to identify the factors that increase and decrease feedback literacy (e.g, Kara, 2021; İstencioğlu, 2022).
- to examine the effects of feedback types and strategies on students and learning in terms of different variables such as achievement, motivation, autonomy, learning, and retention (e.g., Altay, 2018; Karabulut, 2020; Boz, 2018; Çetinkaya, 2018; Yıldırım, 2015).

The fifth question of this research concerns the research models/approaches of the studies analysed. While the research method, data collection method and instruments were included in the majority of the theses examined in the research, the research model was not included. However, if we look at the theses whose model is specified, we see that there are both experimental and quasi-experimental studies that investigate the effect of the type of feedback, being the independent variable of the study, such as the effect of a type of feedback on the student's course success, lack of progress in a skill, and motivation towards the course (e.g, Abdioğlu, 2019; Altay, 2018; Taymaz, 2021; Demir, 2021; Karabulut, 2020; Boz, 2018). However, it has also been observed that there are studies in the research model that were conducted to examine the processes and strategies of teachers in providing feedback, to reveal the development processes of students with the feedback provided to them, or to reveal the opinions of students about the feedback (e.g., Kaya, 2019; Özkale, 2018; Eren, 2018; Dağal, 2012). As mentioned earlier, the model is not specified in most of the studies, and in this regard, it can be said that there are limitations in the studies.

The sixth question of this research concerns the general characteristics of the population and sample of the theses. It was found that the theses were implemented with teachers from different fields of study and students from different levels, but there were also theses conducted with school principals (e.g., Balcı, 2019). A general classification of the reviewed theses shows that 48 of the 68 studies were conducted with students, 13 with teachers, and seven with both teachers and students. In the studies conducted with both students and teachers, diversity is found at different levels. Figure 5 shows the analysis results.

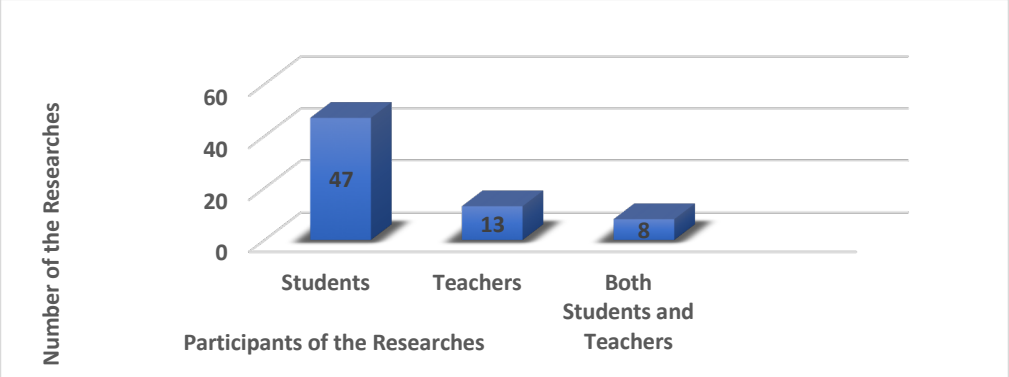


Figure 5. The distribution of the theses with feedback theme by study group/participants

When analysing the sampling techniques of the studies, it was found that in some theses there was no information on the sampling techniques. However, it was observed that different sampling techniques were used according to the structure of the studies, such as the methods, study areas and participants of the studies. The sampling techniques of these studies included convenience sampling (e.g., Abdioğlu, 2019; Boz, 2018), purposive sampling (e.g., Diri, 2022; Yavuz, 2022; Şener, 2019; Kaya, 2019; Yazıcı, 2015; Köroğlu, 2021), multistage sampling (e.g., Balcı, 2021), convenience sampling (e.g., Taymaz, 2021; Çelebi, 2017; Karaağaç, 2014; Çeken, 2016), criterion sampling (e.g., Şener, 2019; Özen, 2019; Yılmaz, 2019), theoretical sampling (e.g., Özkale, 2018), case sampling (e.g..; Özkale, 2018; Eren, 2018,) cluster sampling (e.g., Özkale, 2018) and quota sampling (e.g., Galaly, 2017). Moreover, as can be seen in figure 6, among the theses conducted with students, it was found that 39 studies were conducted with university students, five of them with secondary school students, two of them with special needs students and only one of them with primary school students.

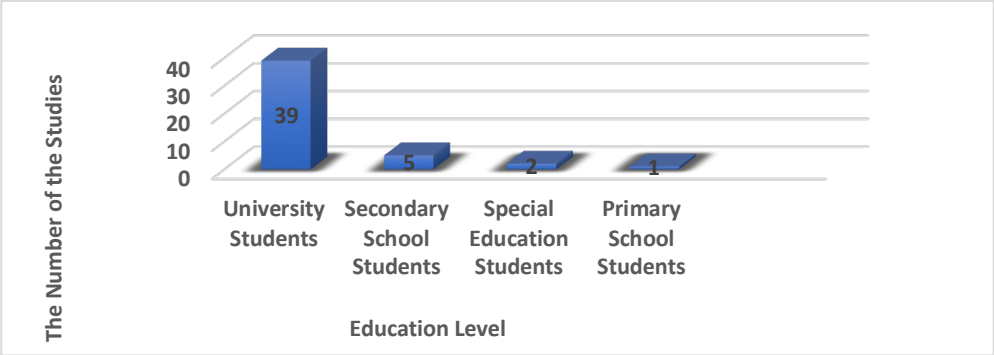


Figure 6. Distribution of theses carried out with students by level

An analysis of the Figure 6. shows that most of the studies conducted with students on the topic of feedback were completed with university students. To these findings, it can be infered that there is a need in the literature for studies with teachers and also with both teachers and pupils from different levels. The seventh question of the research is regarding with in which fields the theses analysed in the research were carried out. The distribution of post-graduate theses on feedback by field of study is shown in Figure 7.

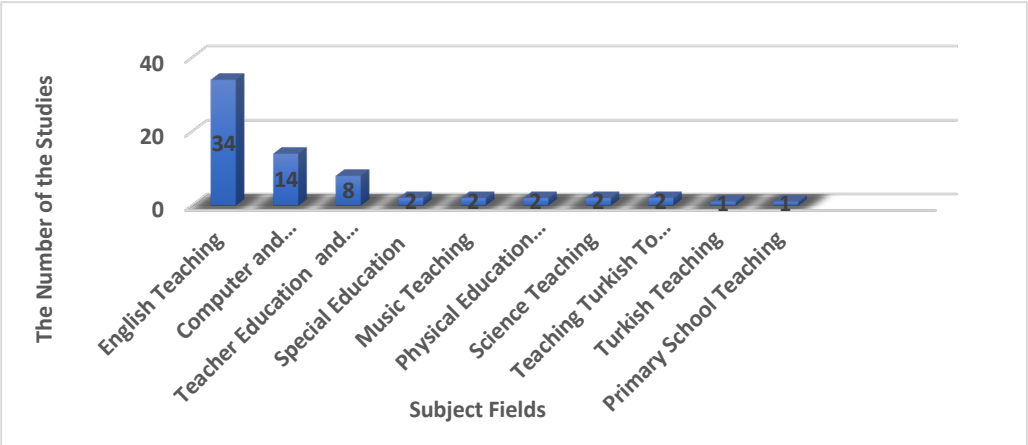


Figure 7. The distribution of the theses with feedback theme by field of study

When Figure 7 is analysed, it is seen that the majority of the feedback-themed studies were conducted in the field of English Language Teaching (n=34). Following the field of English Language Teaching is the field of Computer and Instructional Technologies (n=14) and Special Education. The eighth question of the research is what the data collection methods and tools of the postgraduate theses are analysed. Among the 68 postgraduate theses included in the research, it was found that there were theses conducted using three research methods: qualitative, quantitative and mixed. The distribution of methods used in the theses is shown in Figure 8.

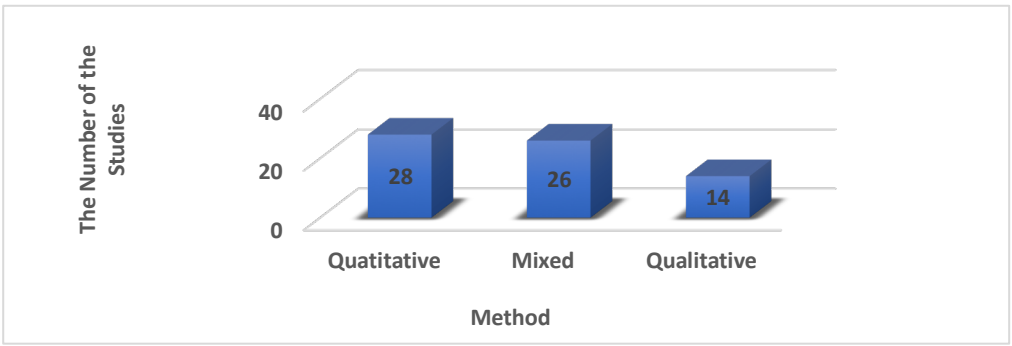


Figure 8. Distribution of the theses in terms of the method used

As can be seen in the Figure 8, 26 of the theses are mixed, 14 are qualitative and 28 are quantitative. Some of the studies, especially the mixed methods studies, used more than one data collection method and tool. The review revealed that achievement tests, pre-post tests, interviews and semi-structured interview forms, questionnaires and scales were the most commonly used data collection methods and tools. Other data collection methods and instruments used in the studies included observation and accompanying checklists, written tests, compositions, diaries and document analysis. Achievement tests, pre-post tests and writing tests were used in 12 of the studies analysed. Although only achievement tests were used in some of these studies, the majority of them were supported by one or more other data collection tools such as scales, interviews or student compositions (e.g., Abdioğlu, 2019; Demir, 2021; Erdoğmuş, 2020; Cengiz, 2019; Boz, 2018; Emirtekin, 2019). Out of the 68 studies reviewed, interviews were used as the data collection method in 31 studies, and only four of these 31 studies used the interview method exclusively (e.g., İstencioğlu, 2022; Kara, 2021; Güler, 2016; Yılmaz, 2019). In other studies, pre-test post-test was used along with other data collection methods and instruments such as scales, questionnaires, writing tests, and observations either as a component of data triangulation to build the studies' reliability and validity or to collect data for the qualitative dimension of the study in mixed methods studies (e.g., Özen, 2019; Gümüş, 2019; Çelebi, 2017; Dokuzoğlu, 2010; Yiğit, 2020).

It was found that 17 studies were conducted using the questionnaire technique, which is amongst the most prevalent of data collection technique, and tools employed in the studies analysed. In 10 of these 17 studies, the questionnaire technique was employed as one of several data collection methods of a mixed method study (e.g., Yılmaz, 2021; Kaya, 2019; Kağıtcı, 2013; Dokuzoğlu, 2010; Taleb, 2022; Köroğlu, 2021). In 3 of these 17 studies where the questionnaire instrument was used, the questionnaire instrument was used as the only data collection technique and data collection

tool of the study (e.g., Coşkun, 2007; Karabulut, 2020; Galaly, 2017). In other studies, different data collection techniques and tools such as observation, inventory, composition, portfolio and interview were used together (e.g., Bayram, 2022; Yılmaz, 2011; Kaya, 2019; Galaly, 2017; Kağıtcı, 2013).

Scales, another data collection tool, was used as a data collection tool in 13 out of 68 studies, being one of the most common data collection tools in the studies. It was found that 8 of these 13 studies were in the field of information technology and most of them were mixed methods studies. The others are studies carried out in the fields of educational administration, Turkish, pre-school and teacher education. The scales used can be listed as follows; "The Short Form of User Engagement Scale" and "The Metacognitive Awareness Inventory" (Diri, 2022), "Principal Feedback Scale" developed by the researcher (Balcı, 2021), "Flow Experience Scale", "Cognitive Load Scale" (Erdoğmuş, 2020), "Motivation and Metacognition Scale" (Özen, 2019), "Cognitive Load Scale" (Emirtekin, 2019), "Attitude Scale Regarding Feedback on Writing Skills" (Eren, 2018), "Teacher Performance Evaluation Scale" (Dağal, 2012), "Motivation Scale", "Formative Feedback Perception Scale", "Motivation and Learning Strategies Scale" (Yiğit, 2020), "Situational Intrinsic Motivation Scale", "Perception of Return Benefit and Self-Efficacy Scale for Learning and Performance" (Yeşil, 2021), "Motivation and Learning Strategies Scale" (Keskin, 2019), "Instructional Material Motivation Scale" (Yabanova, 2016), "Prospective Teacher's Self-Related Efficacy Belief Scale" (Hurioğlu, 2016), and a 5-point Likert-type scale in which the researcher evaluates students' performance in each skill (Müftüler, 2005).

The nineth and final research question relates to the types of data analysis used in theses. In the light of this research question, an examination of the types of data analysis in the theses reveals a diversity in the types of analysis as well as in the data collection procedures and instruments. In the theses analysed, data were collected using quantitative methods such as questionnaires, scales, achievement tests, pre-tests, post-tests and written exams, or qualitative methods such as semi-structured interview forms, open-ended questions, reflective diaries, observations and document analysis. However, mixed methods studies used both quantitative and qualitative methods to collect data. First of all, when the analyses of the data collected by quantitative methods are investigated, it is noticed that the statistical analysis of the data is fulfilled with package programs such as SPSS and LISREL (e.g., Balcı, 2021; Diri, 2022).

In this context, there are theses based on experimental research that attempt to investigate the effect of a type or application of feedback on student achievement, motivation, attitudes to the course and retention. In these studies, data were collected using quantitative data collection instruments such as achievement tests, pre- and post-test questionnaires, attitude or motivation scales, or written examinations. To analyse these data, parametric or non-parametric statistical analyses were used, depending on the sample size or whether the distributions were normal or not. On the other hand, among the theses reviewed, it was found that there were theses that were designed to uncover and describe an existing situation, such as teachers' feedback preferences, examining feedback processes, uncovering teachers' or students' feedback literacy, examining feedback strategies used in the classroom in terms of teachers' and students' preferences. When analysing these studies in terms of data collection methods and tools, it was found that data were collected through qualitative methods such as focus group interviews with students and/or teachers, videotaped lessons, observations, reflective diaries, checklists. In the data analyses of these studies, it was observed that the researchers analysed the qualitative data obtained by separating the responses to each question into upper categories and then into subcategories, creating common codes and modelling them using programs such as Nvivo or MAXQDA software, transcribing the audio-recorded focus group interviews and looking for common patterns in the students' responses in the transcripts, coding or analysing the data obtained through the document analysis method using descriptive, content or inductive analysis methods (e.g., İstencioğlu, 2022; Yavuz, 2022; Kara, 2021; Taymaz, 2021; Abdioğlu, 2019).

Discussion

In the study, the main purpose of which was to perform a content analysis on feedback-themed postgraduate theses (2000-2023), the following main results were obtained. Accordingly, feedback-themed theses (2000-2023):

- has shown a different distribution according to the years, however, the most thesis studies were conducted between 2015-2020.

- were conducted at Master's level mostly (n=51).
- concentrated in the dimension of "teachers' in-class feedback practices and their views on feedback" mostly,
- has been studied in various fields, but it has been mostly analysed in the fields of English language teaching and Computer and Instructional Technologies.
- has also been studied within the scope of teacher education and teaching practice.
- designed for different purposes. At this point, the main objectives such as determining the in-class feedback practices of teachers in different disciplines, determining students' feedback preferences, examining the feedback literacy of teachers or students, the effect of feedback types and strategies on factors such as achievement or motivation are noteworthy.
- also showed diversity in terms of the research models/approaches used. The completed theses were predominantly quantitative, followed by mixed design. Qualitative approach was used the least.
- were conducted on different study groups. However, predominantly theses included students from various levels as study groups. The number of theses including university students in the study groups is higher than the others.
- were formed with different sampling techniques. In some theses, information about sampling techniques was not given and convenience sampling, purposive sampling, criterion sampling, cluster sampling was preferred.
- achievement tests, interviews, questionnaires and scales were the most frequently used data collection tools or techniques.

The content analysis of postgraduate theses on the topic of feedback showed that most of the studies were conducted in the field of English language teaching in terms of the field of study (e.g., Abdioğlu, 2019; Bayram, 2022; Yılmaz, 2021; Karabulut, 2020). When examining the studies on the topic of feedback in the field of English language teaching, the types of written and oral feedback and the effects of these types of feedback on different variables such as students' achievement, motivation, and progress in writing or speaking skills have been investigated (e.g., Altay, 2018; Karabulut, 2020; Taleb, 2022; Uzun, 2018; Çiftci, 2011). It has been observed that studies in the field of English language teaching focus on writing and speaking skills in English language teaching, but there are no studies on other skills and sub-skills that have an important place in language teaching, such as listening, reading, grammar teaching, vocabulary teaching. Although English language teaching starts from the second grade of primary school in our country, it has been observed that most of the studies conducted in this area have been conducted with university students and teachers (e.g. Altay, 2018; Diri, 2022; Taymaz, 2021; Yazıcı, 2015). Although the majority of studies on the topic of feedback have been conducted in the field of English language teaching, it has been observed that there are only two studies on the dimension of "feedback literacy", which is a new concept in the literature and needs to be researched (e.g., İstencioğlu, 2022; Kara, 2021). Among them, İstencioğlu (2022) aimed to identify teachers' views on feedback, the feedback practices they apply and recommend, and teachers' competencies within the framework of feedback literacy competencies. The study was a basic qualitative research and data were collected through interviews with teachers. In another study, Kara (2021) aimed to identify the types, amount and timing of feedback, feedback literacy indicators and factors that increase and decrease the use of feedback in her study with university students. Similarly, this study is basic qualitative research conducted through interviews.

It is seen that feedback literacy is a topic that has recently attracted attention in the world literature (e.g., Carless, 2020; Carless and Boud, 2018; Malecka et al., 2020; Molloy et al., 2020) and there is a need for studies on this dimension of feedback in our country. With the new studies to be conducted, it is seen that there is a need for survey and scale studies that will facilitate reaching wider audiences in studies to be conducted on teacher and student feedback literacy. It is also seen that the second most studied field in the studies on the feedback theme is the field of Information Technologies (e.g., Yeşil, 2021; Çeken, 2016; Keskin, 2019; Yabanova, 2016). In the studies conducted in this field, the effect of feedback types used in computer-aided learning environments on learner achievement and motivation (e.g. Özdemir, 2015; Emirtekin, 2019; Diri, 2022), intelligent feedback systems developed with artificial intelligence techniques (e.g., Güler, 2016; Çeken, 2016; Keskin, 2019; Özen, 2019) and studies aiming to reveal what students'

preferences are for both feedback in online learning environments and intelligent feedback systems. When the studies on feedback provided in online learning environments and feedback systems developed with artificial intelligence support are examined, the majority of the studies (n = 8) are published in 2019 and later (e.g. Diri, 2022; Demir, 2021; Erdoğmuş, 2020; Emirtekin, 2019). From this point of view, it can be said that the distance education period brought by the compulsory conditions of the pandemic period and developments in the field of artificial intelligence may have made it necessary to study the types of feedback used in online settings and artificial intelligence-supported intelligent feedback systems. However, 6 of the studies conducted in this field are studies conducted before 2019 (e.g., Özgür, 2005; Özbaş, 2009; Özdemir, 2015; Güler, 2016) and the types of feedback used in online environments have been a factor that attracted the attention of researchers before 2019. Apart from English language teaching, information technologies and teacher education, studies have been conducted in different fields such as Science, Music, Physical Education teaching, Information Technologies Special Education, Turkish Teaching to Foreigners, Turkish Teaching (e.g.). However, it is seen that there are no studies on the feedback theme in secondary education level in teaching areas such as Chemistry, Physics, Biology, Literature, Mathematics, and Geometry.

When the feedback-themed studies analysed within the scope of this research are evaluated in terms of teaching levels, it is seen that the studies are mostly conducted at higher education level. However, feedback is an important element that increases the quality of education in all areas and levels of education (Hattie & Timperley, 2007). For this reason, studies on feedback can be conducted at different levels of education such as primary, secondary and secondary education. In the feedback-themed postgraduate theses, the most studied dimension was found to be the effect/effectiveness of a feedback type (n=45). The majority of the studies in this dimension were conducted in the field of English language teaching on the effect of written and oral feedback types on students' writing or speaking achievement and skills. In this respect, it is seen that the studies are mostly in the field of English language teaching and in the effect/effectiveness dimension of feedback types. It can be said that there is a need for studies in which teachers' in-class feedback practices are revealed, teachers' cognitions about the feedback element are investigated, and scale development studies that will make it possible to carry out research in this field by collecting data from large masses. In a similar study, Özalp and Kaymakçı (2021) analysed the theses on feedback in the field of Educational Sciences in Turkey and found similar results. Therefore, Özalp and Kaymakçı (2021) analysed 83 postgraduate theses on the theme of feedback between 1996 and 2021, and unlike this study, they did not use the criterion that the studies were conducted in state universities. Within the scope of the examination, the distribution of theses according to years was examined and it was found that the most studies on feedback were conducted in 2019. In the distribution of theses according to postgraduate levels, it was found that most theses were conducted at the master's level, feedback-themed studies were mostly conducted at Gazi University, the effect of feedback was investigated the most, and the undergraduate level stood out in the distribution of studies according to levels.

Conclusion

To conclude, the suggestions developed in the research based on the results obtained as a result of the content analysis of the studies on feedback can be summarised as follows:

- Although a significant number of thesis studies on feedback as an indispensable element of learning-teaching processes have been conducted between 2000 and 2023, it can be suggested that these studies should be increased in number and enriched in terms of the dimension they examine. As it is observed in the results of this study, although it is the subject of theses in certain fields (for example, English language teaching), it is noteworthy that the subject is not analysed much in other fields. At this point, studies focussing on the feedback theme in other fields can be planned and its effect can be analysed in these fields as well.
- In this study, it was determined that feedback-oriented theses were mostly carried out with university students, and at this point, higher education was predominantly studied. Studies on the feedback theme, which is significant for almost every level due to its characteristics, can be conducted at almost every level.

- Finally, feedback-themed studies were also seen in the dimension of teacher education and teaching practice, but it was noteworthy that there were very few of them. Especially in recent years, new studies can be designed on the use of feedback in teacher education with the element of technology. Different research designs and data collection methods can be utilised in new studies

Recommendations

Based on the results of the study, feedback-oriented studies can be examined with unexplored dimensions, and qualitative research can be conducted on participants' views, applications, and experiences related to the concept of feedback.

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References

Abdioğlu, M. (2019, Spring). *An investigation of two teacher written feedback procedures in EFL classes: form-focused and content-focused feedback*. Master thesis, Karadeniz Technical University, Trabzon.

Altay, A (2018). *Explorıng the effects of feedback types and wıkı on efl learners' wrıtıng performance.* Master thesis, Middle East Technical University, Ankara.

Balcı, S. (2021). *Okul müdürlerinin sınıf içi öğretimin iyileştirilmesine yönelik etkili geri bildirim verme kapasitelerini geliştirme. (Improving the capacity of school principals to give effective feedback for the improvement of classroom teaching).* Doctoral thesis, Gaziantep University, Gaziantep.

Bayram, S. (2022). Ortaokul ve liselerde ingilizce öğretmenlerinin başvurduğu sözlü düzeltici geri bildirim türleri ve uygulamaları. *(Types and applications of verbal corrective feedback applied by English teachers in secondary and high schools).* Master thesis, Van Yüzüncü Yıl University, Van.

Bloom, B. S. (2016). *İnsan Nitelikleri ve Okulda Öğrenme. (Human Qualities and Learning at School).* (Çev. Durmuş Ali Özçelik). Ankara: Milli Eğitim Basımevi.

Bloom, L. (1998). *Language acquisition in its developmental context.*

Boz, S. (2019). *Geri bildirim olarak çoklu değerlendirme yaklaşımının Türkçe öğrenen yabancı öğrencilerin yazma becerisine etkisi. (The effect of multiple assessment approach as feedback on the writing skills of foreign students learning Turkish).* Master thesis, Gaziantep University, Gaziantep.

Bozkır, C. (2009). *The Effects of Feedback Essay Type and Essay Type on English Language Writing Development.* Doctoral thesis, Marmara University, İstanbul.

Bruner, J., S. (1974). *Toward a theory of instruction.* Cambridge, Mass: Harvard University Press.

Can, E. (2019). *The effect of written peer feedback training on Turkish efl students' feedback types and writing performance.* Master thesis, Anadolu University, Eskişehir.

Carless, D. (2006). Differing perceptions in the feedback process. *Studies in Higher Education 31*(2), 219–233. https://doi.org/1080/03075070600572132

Carless, D. (2015). *Excellence in University Assessment: Learning from Award-Winning Practice.* London: Routledge. Carless, D. (2019).

Carless, D. (2020). Double duty, shared responsibilities and feedback literacy. *Perspectives on Medical Education, 9*(4), 199–200. https://doi.org/10.1007/s40037-020-00599-9

Carless, D., & Boud, D. (2018). The development of student feedback literacy: Enabling uptake of feedback. *Assessment & Evaluation in Higher Education, 43*(8), 1315–1325. https://doi.org/10.1080/02602938.2018.1463354

Carless, D., & Winstone, N. (2020). Teacher feedback literacy and its interplay with student feedback literacy. *Teaching in Higher Education, 1*–14. https://doi.org/10.1080/13562517.2020.1782372

Carless, D., Salter, D. Yang, M., & Lam, J. (2011). Developing sustainable feedback practices. *Studies in Higher Education 36* (4), 395–407. https://doi.org/10.1080/03075071003642449

Cengiz, Ö. (2019). *The effects of a reflectıve traınıng program on the awareness of turkısh pre-servıce efl teachers' oral correctıve feedback strategıes.* Master thesıs, Bursa Uludag University, Bursa.

Coşkun, A. (2007). *Candidate English teachers' preferences about error feedback in L2 writing classes.* Master thesis, Abant İzzet Baysal University, Bolu.

Çeken, B. (2016). *The effects of tutorial feedback type on pre-service teachers' choice of feedback type in their development of learning objects*. Master Thesis, Boğaziçi University, İstanbul.

Çelebi, S. (2017). *Yabancı dil olarak Türkçe öğretiminde görsel geri bildirim etkinlikleriyle gerçekleştirilen bürün öğretiminin sesli okuma becerisine etkisi. (The effect of the teaching of the bünün carried out with visual feedback activities on reading aloud skills in teaching Turkish as a foreign language).* Doctoral Thesis, Atatürk University, Erzurum.

Çetinkaya, N. (2018). *Hikâye haritası yönteminin video geri bildirim ile sunumunun zihin yetersizliği olan çocukların okuduğunu anlama becerisindeki etkililiği. (The effectiveness of the presentation of the story map method with video feedback on the reading comprehension skills of children with intellectual disability).* Master thesis, Bolu Abant İzzet Baysal University, Bolu.

Çiftçi, A. (2011). *The effect of a training program on writıng achievement and peer-feedback.* Master thesis, Dokuz Eylül University, İzmir.

Dağal, A. B. (2012). *Okul öncesi eğitim kurumlarında görev yapan öğretmenlerin performanslarının 360 derece geri bildirim yoluyla değerlendirilmesi. (Evaluating the performance of teachers working in pre-school education institutions through 360-degree feedback).* Doctoral thesis, Marmara University, İstanbul.

Dayı, D. (2009). *Öğretmen adaylarının öğretme becerilerini edinmelerinde, ipucu ve dönüt verilerek yapılan öğretim ile sadece dönüt verilerek yapılan öğretimin etkililiği, verimliliği, sürekliliğe ve genellemeye olan etkileri. (The effectiveness, efficiency, continuity and generalisation effects of teaching with prompts and feedback and teaching with feedback only on pre-service teachers' acquisition of teaching skills).* Doctoral thesis, Gazi University, Ankara.

Demir, F. (2013). *Sınıf öğretmenlerinin kullandıkları dönüt türleri. (Types of feedback used by classroom teachers).* Master thesis, Gazi University, Ankara.

Demir, Y. (2020). *Bilişim teknolojileri ve yazılım dersi çevrimiçi ödevlerine verilen duygusal motivasyonel geri bildirim mesajlarının akademik başarıya etkisi. (The effect of emotional motivational feedback messages given to online assignments in information technologies and software course on academic achievement).* Master thesis, Ege University, İzmir.

Diri, E.R. (2022). *An ınvestıgatıon of usıng dıfferent types of feedback strategıes ın ınteractıve vıdeo lectures.* Master thesis, Boğaziçi University, İstanbul.

Dokuzoğlu, S. (2010). *L2 writing teachers' perceptions of mistakes in student writing and their preferences regarding feedback: the case of a Turkish private university.* Master thesis, Middle East Technical University, Ankara.

Ekinci, M. & Ekinci, M. (2020). Using error correction codes to improve writing success of EFL learners. *International Journal of Language Academy, 34*(34), 282–293. https://doi.org/10.29228/ijla.45324

Emirtekin, E. (2019). *Eğitsel videolardaki sorulara yönelik geri bildirim türünün öğretmen adaylarının başarı ve bilişsel yüklerine etkisi. (The effect of feedback type for questions in educational videos on pre-service teachers' achievement and cognitive load).* Master thesis, Ege University, İzmir.

Erdem, A. (2006). *Silahlı Kuvvetler Bando Okulları Komutanlığı'nda görev yapan trompet öğretmenlerine ödüllendirme becerisinin kazandırılmasında bilgilendirme ve dönüt verme süreçlerinin etkililiğinin incelenmesi. (Examining the effectiveness of information and feedback processes in teaching rewarding skills to trumpet teachers working in Armed Forces Band Schools Command).* Master thesis, Gazi University, Ankara.

Eren, M. (2018). *Ortaokul öğrencilerinin yazma sürecinde aldıkları geri bildirim ile ilgili görüşleri. (Secondary school students' views on the feedback they receive in the writing process).* Mastere thesis, Çanakkale Onsekiz Mart University, Çanakkale.

Ergin, A. (2012). *Eğitimde etkili iletişim (Effective communication in education). (*6th edition). Ankara: Anı.

Galaly, F. J. (2017). *Iraqı hıgh-school efl students' and teachers' attıtudes towards wrıtten feedback ın wrıtıng classes.* Master thesis, A case of Suleymanıyah and Rbıl. Gazıantep University, Gaziantep.

Güler, M. (2016). *Mobil ortamlarda alıştırma uygulama yazılımlarının içerik gönderim periyotları, soru türü ve geri bildirim açısından incelenmesi: Kpsscell örneği. (Examination of practice application software in mobile environments in terms of content submission periods, question type and feedback: Kpsscell example).* Master thesis, Atatürk University, Erzurum.

Gümüş, H. (2019). *An Investıgatıon Into Pre-Servıce Efl Teachers' L2 Wrıtıng Dıfficultıes And Theır Vıews And Preferences On Tutors' Wrıtten Feedback*. Master thesis, Pamukkale University, Denizli.

Hattie, J., & Gan, M. (2011). *Instruction based on feedback.* In P. Alexander & R. E. Mayer (Eds.), *Handbook of research on learning and instruction,* 249–271.

Hill, D. A., & Flores, M. M. (2014). Modeling positive behavior interventions and supports for preservice teachers. *Journal of Positive Behavior Interventions, 16*(2), 93-101.

Hurioğlu, L. (2016). *Öğretmenlik uygulaması dersinde dönüt-düzeltmenin öğretmen adaylarının öğretimi planlama ve uygulama becerileri ile öz-yeterlik düzeylerine etkisi. (The effect of feedback-correction in teaching practice course on pre-service teachers' teaching planning and implementation skills and self-efficacy levels).* Doctoral thesis. Çukurova University, Adana.

İstencioğlu, T. (2022). *Investıgatıng teachers' vıews and practıces of feedback ın englısh language educatıon ın mıddle schools from a teacher feedback lıteracy framework perspectıve.* Master thesis, Mıddle East Technıcal University, Ankara.

Kağıtçı, B. (2013). *The relationshıp between students' preference for written feedback and improvement ın writing: Is the preferred one the best one?* Master thesis, Mıddle East Technıcal University, Ankara.

Kahyaoğlu E., Y. (2020). *Oyun tabanlı öğrenme ortamında eğitsel ajan ve geri bildirim türlerinin akademik başarı, akış deneyimi ve bilişsel yük açısından incelenmesi. (Investigation of educational agent and feedback types in game-based learning environment in terms of academic achievement, flow experience and cognitive load).* Doctoral thesis, Anadolu University, Eskişehir.

Kara, C. (2021). *A qualitative study of feedback literacy in higher education: uncovering enhancing and impeding factors.* Master thesis, Middle East Technical University, Ankara.

Karaağaç, G. (2014). *Teacher cognıtıon on wrıtten feedback: novıce and experıenced teachers' belıefs, attıtudes and practıces.* Master thesis, Mıddle East Technıcal University, Ankara.

Karabulut, İ. (2020). *The effect of dıfferent wrıtten correctıve feedback types on learner autonomy ın wrıtıng skill.* Master thesis, Gazi University, Ankara.

Kaya, S. (2019). *Üniversite İngilizce hazırlık okulu öğrencilerinin yazma becerisi geri bildirim sürecinin incelenmesi. (Investigating the writing skill feedback process of university English preparatory school students).* Master thesis, Düzce University, Düzce.

Keskin, S. (2019). *Uyarlanabilir dönüt sistemi tasarımı için kullanıcı profillerinin belirlenmesi. (Determination of user profiles for adaptive feedback system design).* Doctoral thesis, Hacettepe University, Ankara.

Köroğlu, H. (2021). *Elt and non-elt pre-service language teachers' stance on oral corrective feedback provision: A Turkısh context.* Doctoral thesis, Karadeniz Technıcal University, Trabzon.

Kurtuluş, K., & Kaymaz, K. (2007). Davraniş Boyutuyla Performans Geribildirim Olgusu ve Süreci. (Performance Feedback Phenomenon and Process with Behavioural Dimension). *Ankara Üniversitesi SBF Dergisi, 62*(04), 141-178.

Oral, B. (2000). Öğretmen adaylarının algılarına göre ilköğretim sınıf öğretmenlerinin dönüt ve düzeltme davranışları. (Feedback and correction behaviours of primary school classroom teachers according to pre-service teachers' perceptions). *Eğitim Araştırmaları, 2,* 59–64.

Orhan Özen, S. (2019). *Öğrenenlerin e-değerlendirmeye dayalı kişiselleştirilmiş geribildirim yollarının incelelenmesi. (Examining learners' personalised feedback pathways based on e-assessment).* Doctoral thesis, Eskişehir Osmangazi University, Eskişehir.

Özbay, F. (2009). *Bilgisayar destekli İngilizce kelime alıştırmalarında dönüt türlerinin öğrenci öğrenmesi üzerindeki etkinliğinin incelenmesi. (Analysing the effectiveness of feedback types on student learning in computer-assisted English vocabulary exercises).* Master thesis, Zonguldak Karaelmas University, Zonguldak

Özdemir, D. (2015). *Özel eğitime yönelik insansı robot ve bilgisayar destekli öğrenme ortamlarının geliştirilmesi ve bu ortamlardaki etkileşimlerin dönüt türleri açısından incelenmesi. (Development of humanoid robot and computer assisted learning environments for special education and analysing the interactions in these environments in terms of feedback types).* Doctoral thesis, Atatürk University, Erzurum.

Özgür, H. (2005). *İlköğretim için Hazırlanmış Olan Bilgisayar Destekli Eğitim Yazılımlarında Kulanılan Geri Bildirim Türlerinin Akademik Başarıya Etkisi (The Effect of Feedback Types Used in Computer Assisted Educational Software Prepared for Primary Education on Academic Achievement).* Doctoral thesis, Marmara University, İstanbul.

Özkale, U. (2018). *Fen bilgisi öğretmenlerinin sınıf ortamında kullandıkları geri bildirim stratejilerinin incelenmesi. (Investigation of feedback strategies used by science teachers in the classroom)*. Master thesis, Mersin University, Mersin.

Pastakkaya, S. (2020). *A comparative study of experienced and less experienced efl teachers' stated beliefs about oral corrective feedback and their classroom practices.* Master thesis, Anadolu University, Eskişehir.

Rijlaarsdam, G., Bergh, H., & Couzijn, M. (Eds.). (2005). *Effective learning and teaching of writing: A handbook of writing in education.*

Sadler, D., R. (1989). Formative assessment and the design of instructional system. *Instructional Science, 18*(2), 119–144. https://doi.org/10.1007/BF00117714

Sarıcan, S. (2013). *Müzik eğitimi anabilim dalı öğrencilerinin müzikte performans kaygı düzeylerine video geri bildirim yönteminin etkisi. (The effect of video feedback method on music performance anxiety levels of music education department students*). Doctoral thesis, Gazi University, Ankara

Senemoğlu, N. (2020). *Gelişim öğrenme ve öğretim kuramdan uygulamaya*. *(Development, learning and teaching theory to practice).* Ankara: Anı Yayıncılık.

Şahin, C. (2006). *Gramer Derslerinde Öğretmelerin Kullandıkları Sözlü Dönüt Teknikleri ve Öğrencilerin Bu Dönütlere Gösterdikleri Tepkiler. (Oral Feedback Techniques Used by Teachers in Grammar Lessons and Students' Reactions to This Feedback).* Master thesis, Anadolu University, Eskişehir.

Şener, B. M. (2019). *EFL instructors' beliefs and practices about oral corrective feedback*. Master thesis, Çukurova University, Adana.

Taleb, İ. (2022). *The use of collaborative learning tools for giving feedback to foster the writing skills of EFL learners.* Master thesis, Bolu Abant İzzet Baysal Unıversıty, Bolu.

Taymaz, N. (2021). *Promotıng peer scaffoldıng through analytıc feedback crıterıa: from a perspectıve of error analysıs ın wrıtıng based on learner corpus.* Master thesis, Gazi University, Ankara.

Winne, P., H. & Butler, D., L. (1994). Student cognitive processing and learning. *The international encyclopedia of education, 10*, 5738-5745.

Yabanova, U. (2016). *Zeski geri dönüt sistemli öğrenme nesnelerinin başarı, motivasyon ve kalıcılık üzerindeki etkileri. (The effects of learning objects with intelligent feedback system on achievement, motivation and retention)*. Master thesis, Çanakkale Onsekiz Mart University, Çanakkale.

Yavuz, B. (2022). *Sınıf öğretmenlerinin geri bildirim kullanım durumlarının incelenmesi. (Investigation of classroom teachers' use of feedback).* Master thesis, Çanakkale Onsekiz Mart University, Çanakkale.

Yazıcı, S. (2015). *Wrıtten or oral teacher feedback: whıch one facılıtates ıdea development ın wrıtıng classes?* Master thesis, Gazi University, Ankara.

Yeşil, D. (2021). *Dönüt türünün içsel motivasyon, performansa yönelik öz-yeterlik ve dönüte yönelik yarar algısı üzerine etkisi. (The effect of feedback type on intrinsic motivation, self-efficacy for performance and perception of benefit of feedback).* Master thesis, Hacettepe University, Ankara.

Yılmaz, G. (2019). *Öğretmenlik uygulamasında dönüt konusunda öğretmen adaylarının görüşleri. (Pre-service teachers' views on feedback in teaching practice).* Master thesis, Gazi University, Ankara.

Yılmaz, İ. (2021). *Student and teacher preferences in using written corrective feedback in EnglİsH preparatory classes*. Master thesis, Hacettepe University, Ankara.

Yiğit, M. F. (2020). *Video dönüt uygulamasının algılanan dönüt kalitesi, dönüt kullanım düzeyi ve motivasyona etkisi. (The effect of video feedback application on perceived feedback quality, feedback utilisation level and motivation).* Doctoral thesis, Hacettepe University, Ankara.

Yiğit, T. (2019). *Beliefs and practices of efl instructors on oral corrective feedback and students' perceptions.* Master thesis, Bursa Uludag Unıversıty, Bursa.

Appendix 1. Studies evaluated in the research

No.	Imprint
T1	İstencioğlu, T. (2022). Investıgatıng teachers' vıews and practıces of feedback ın englısh language educatıon ın mıddle schools from a teacher feedback lıteracy framework perspectıve. Master's Thesis. Mıddle East Technıcal Unıversıty, Ankara.
T2	Abdioğlu, M. (2019, Spring). An investigation of two teacher written feedback procedures in EFL classes: form-focused and content-focused feedback . Master's thesis. Karadeniz Technical University.
T3	Gezer Demirdağli, Ş. (2014). Comparison of the effectiveness of a teaching plan prepared for teachers working in the field of special education with and without immediate feedback. Master's thesis. Marmara University, İstanbul
T4	Altay, A (2018). Explorıng the effects of feedback types and wıkı on efl learners' wrıtıng performance. Master of Arts Thesis. Middle East Technical University, Ankara.
T5	Kara, C. (2021). A qualitative study of feedback literacy in higher education: uncovering enhancing and impeding factors. Master's Thesis. Middle East Technical University, Ankara.
T6	Diri, E.R. (2022). An ınvestıgatıon of usıng dıfferent types of feedback strategıes ın ınteractıve vıdeo lectures. Master of Arts Thesis. Boğaziçi Unıversıty, İstanbul.
T7	Yavuz, B. (2022). Investigation of classroom teachers' use of feedback. Master's thesis. Çanakkale On Sekiz Mart University, Çanakkale.
T8	Bayram, S.(2022). Types and applications of verbal corrective feedback applied by English teachers in secondary and high schools. Master's thesis. Van Yüzüncü Yıl University, VanT8
T9	Balcı, S. (2021). Developing the capacity of school principals to give effective feedback for the improvement of classroom teaching. Doctoral dissertation. Gaziantep University, Gaziantep.
T10	Taymaz,N. (2021). Promotıng peer scaffoldıng through analytıc feedback crıterıa: from a perspectıve of error analysıs ın wrıtıng based on learner corpus. Master of Arts Thesis. Gazi Unıversıty, Ankara.
T11	Yılmaz, İ. (2021). Student and teacher preferences ın usıng wrıtten correctıve feedback ın englısh preparatory classes. Master's Thesis. Hacettepe University, Ankara.
T12	Demir, Y. (2020). The effect of emotional motivational feedback messages given to online assignments of information technologies and software course on academic success. Master's thesis. Ege University, Izmir.
T13	Yoğun, M. S. (2020). Analysis of lesson observation through peer coaching in a continuing professional development program: Teachers' perceptions of professional development, effectiveness and feedback. Master's Thesis Gaziantep University, Gaziantep.
T14	Kahyaoğlu Erdoğmuş, Y. (2020). Examination of educational agent and feedback types in game-based learning environment in terms of academic achievement, flow experience and cognitive load. Doctoral dissertation. Anadolu University, Eskisehir.
T15	Karabulut, İ. (2020). The effect of dıfferent wrıtten correctıve feedback types on learner autonomy ın wrıtıng skill. Master's Thesıs. Gazı Universıty, Ankara.
T16	Cengiz, Ö. (2019). The effects of a reflectıve traınıng program on the awareness of turkısh pre-servıce efl teachers' oral correctıve feedback strategıes. . Master's Thesıs. Bursa Uludag Universıty, Bursa
T17	Boz, S. (2019). The effect of multiple assessment approach as feedback on the writing skills of foreign students learning Turkish. Master's thesis. Gaziantep University, Gaziantep
T18	Şener, B. M. (2019). Efl ınstructors' belıefs and practıces about oral correctıve feedback. Master's Thesis. Çukurova Universıty, Adana.
T19	Orhan Özen, S. (2019). Examining the personalized feedback paths of learners based on e-assessment. Doctoral dissertation. Eskişehir Osmangazi University, Eskişehir.
T20	Kaya, S. (2019). Examining the writing skill feedback process of university English preparatory school students. Master's thesis. Düzce University, Düzce
T21	Emirtekin, E. (2019). The effect of feedback type for questions in educational videos on pre-service teachers' achievement and cognitive load. Master's thesis. Ege University, Izmir.
T22	Gümüş, H. (2019). An ınvestıgatıon ınto pre-servıce efl teachers' l2 wrıtıng dıfficultıes and theır vıews and preferences on tutors' wrıtten feedback. Master'sThesis. Pamukkale University, Denizli.
T23	Çetinkaya, N. (2018). The effectiveness of the presentation of the story map method with video feedback on the reading comprehension skills of children with mental disabilities. Master's thesis. Bolu Abant Izzet Baysal University, Bolu.
T24	Özkale, U. (2018). Investigation of the feedback strategies that science teachers use in the classroom. Master's thesis. Mersin University, Mersin.
T25	Eren, M. (2018). Secondary school students' opinions about the feedback they receive in the writing process. Master's thesis. Çanakkale On sekiz Mart University, Çanakkale.

T26 Galaly, F. J. (2017). Iraqı hıgh-school efl students' and teachers' attıtudes towards wrıtten feedback ın wrıtıng classes: A case of Suleymanıyah and Rbıl. Master's Thesis . Gazıantep Universıty, Gaziantep.

T27 Çelebi, S. (2017). The effect of the teaching of the bürün realized with visual feedback activities in Turkish language teaching as a foreign language on reading aloud skills. Doctoral Dissertation. Atatürk University, Erzurum.

T28 Güler, M. (2016). Examination of practice application software in mobile environments in terms of content submission periods, question type and feedback: Kpsscell example. Master's thesis. Ataturk University, Erzurum.

T29 Yazıcı, S. (2015). Wrıtten or oral teacher feedback: whıch one facılıtates ıdea development ın wrıtıng classes? Master's thesis. Gazi University, Ankara.

T30 Karaağaç, G. (2014). Teacher cognıtıon on wrıtten feedback: novıce and experıenced teachers' belıefs, attıtudes and practıces. Master's Thesis. Mıddle East Technıcal Universıty, Ankara.

T31 Kağıtçı, B. (2013). The relationshıp between students' preference for written feedback and improvement in writing: Is the preferred one the best one? . Master'sThesis. Mıddle East Technıcal Universıty, Ankara.

T32 Sarıcan Gündüz, S. (2013). The effect of video feedback method on music education department students' performance anxiety levels. Doctoral Thesis. Gazi University, Ankara.

T33 Çimen, O. (2017). The effect of feedback model applied to teacher candidates on their motivation and reflective thinking tendencies. Doctoral Dissertation. Gazi University, Ankara

T34 Dokuzoğlu, S. (2010). L2 writing teachers' perceptions of mistakes in student writing and their preferences regarding feedback: the case of a Turkish private university. Master's Thesis. Middle East Technical University, Ankara.

T35 Yiğit, T. (2019). Beliefs and practices of efl instructors on oral corrective feedback and students' perceptions. Master's. Thesıs. Bursa Uludag Unıversıty, Bursa.

T36 Çeken, B. (2016). The effects of tutorial feedback type on pre-service teachers' choice of feedback type in their development of learning objects. Master's thesis. Boğaziçi Unıversıty, İstanbul.

T37 Taleb, İ. (2022). The use of collaborative learning tools for giving feedback to foster the writing skills of efl learners. Master's Thesis. Bolu Abant İzzet Baysal Unıversıty, Bolu.

T38 Köroğlu, H. (2021). Elt and non-elt pre-service language teachers' stance on oral corrective feedback provision: A Turkısh context. Doctoral Dıssertatıon. Karadeniz Technıcal Unıversıty, Trabzon

T39 Yeşil, D. (2021). The effect of feedback type on intrinsic motivation, self-efficacy towards performance and perception of benefit towards feedback. Master's thesis. Hacettepe University, Ankara.

T40 Pastakkaya, S. (2020). A comparative study of experienced and less experienced efl teachers' stated beliefs about oral corrective feedback and their classroom practices. Master's Thesıs. Anadolu University, Eskişehir.

T41 Yılmaz, G. (2019). Opinions of prospective teachers on feedback in teaching practice. Master's thesis. Gazi University, Ankara.

T42 Can, E. (2019). The effect of written peer feedback training on Turkish efl students' feedback types and writing performance. Master's Thesıs. Anadolu University, Eskişehir.

T43 Yiğit, T. (2019). Beliefs and practices of efl instructors on oral corrective feedback and students' perceptions. Master's. Thesıs. Bursa Uludag Unıversıty, Bursa.

T44 Uzun, K. (2019). Genre-Based Teaching and Genre-Based Feedback: A Multifaceted Study on Writing Performance and Writing Psychology. Doctoral Thesis. On Sekiz Mart University, Çanakkale.

T45 Keskin, S. (2019). Determination of user profiles for adaptive feedback system design. Doctoral dissertation. Hacettepe University, Ankara.

T46 Yabanova, U. (2016). The effects of learning objects with intelligent feedback system on achievement, motivation and retention. Master's thesis. Çanakkale Onsekiz Mart University, Çanakkale.

T47 Hurioğlu, L. (2016). The effect of feedback-correction on teacher candidates' teaching planning and implementation skills and self-efficacy levels in teaching practice course. Doctoral dissertation. Çukurova University, Adana.

T48 Özdemir, D. (2015). Development of humanoid robot and computer-aided learning environments for special education and examination of interactions in these environments in terms of feedback types. Doctoral dissertation. Atatürk University, Erzurum.

T49 Yıldırım, B. (2015). The effects of educational games, feedback and correction on the learning level and the retention. Master's Thesis. Necmettin Erbakan University, Konya.

T50 Demir, F. (2013). Types of feedback used by classroom teachers. Master's thesis. Gazi University, Ankara.

T51 Çiftçi, A. (2011). The effect of a training program on writıng achievement and peer-feedback. Master's thesis. Dokuz Eylül University, İzmir.

T52 Dokuzoğlu, S. (2010). L2 writing teachers' perceptions of mistakes in student writing and their preferences regarding feedback: the case of a Turkish private university. Master's Thesis. Middle East Technical University, Ankara.

T53 Bozkır, C. (2009). The Effects of Feedback Essay Type and Essay Type on English Language Writing Development. Doctoral dissertation. Marmara Universitesi, İstanbul.

T54 Pekaz, K. (2007). Prompt and feedback techniques in the correction of sound events, punctuation, spelling errors and expression disorders in primary school eighth grade written expressions. Master's thesis. Abant Izzet Baysal University, Bolu.

T55 Coşkun, A. (2007) Candidate English teachers' preferences about error feedback in L2 writing classes. Master's thesis. Abant İzzet Baysal University, Bolu.

T56 Özgür, H. (2005). The Effect of Feedback Types on Academic Achievement in Computer Assisted Educational Software Prepared for Primary Education. Doctoral dissertation. Marmara University, İstanbul.

T57 Arsal, G. (2004). The effect of external and learner-controlled feedback planning on the permanence of intuition and ball throwing skills. Master's Thesis. Middle East Technical University, Ankara

T58 Dayı, D. (2009). The effects of the effectiveness, efficiency, continuity and generalization of the teaching done by giving hint and feedback and the teaching done only by giving feedback on the teacher candidates' acquisition of teaching skills. Doctoral dissertation. Gazi University, Ankara.

T59 Tokdemir Demirel, E. (2009) A research on complementary peer and teacher feedback model in teaching writing skills in second language: peer and teacher feedback or teacher feedback. Doctoral Thesis. Mıddle East Technıcal Unıversıty, Ankara.

T60 Özbaş, F. (2009). Examining the effectiveness of feedback types on student learning in computer-supported English vocabulary exercises. Master's Thesis. Zonguldak Karaelmas University, Zonguldak.

T61 Altunay, B. (2008). The effect of direct instruction-based pre-service teacher evaluation program on special education teachers' evaluation and feedback skills. Doctoral Dissertation. Gazi University, Ankara

T62 Erdem. A. (2006). An Investigation on the efficiency on informing and giving feedback processes in trumpet instructors acquisition of rewarding skills at the armed forces Military Band Schools Command. Master's Thesis. Gazi University, Ankara.

T63 Şahin, C. (2006). Teachers' oral corrective behaviours and learners' reactions to feedbacks received in grammar lessons. Master's thesis. Anadolu University, Eskişehir.

T64 Eş, Ş. (2003). Application of the focus on structure method in English classrooms: focus on structure through input flow production and corrective feedback. Master Thesis. Anadolu University, Eskisehir.

T65 Uysal, A. (2001). The effects of teaching mentally handicapped special class students to request feedback and/or reinforcement from their teachers. Doctoral dissertation. Anadolu University, Eskişehir.

MT66 Müftüler, M. (2005). Effect of verbal feedback and self-evaluation on learning fundamental basketball skills. Master's thesis. Middle East Technical University, Ankara.

T67 Tümkaya, U. (2003). Comparison of two different written feedback methods given by the teacher to prep students studying in the Department of Basic English and students' attitudes towards these methods. Master's Thesis, Middle East Technical University, Ankara.

T68 Moran, B. (2003). The Effect of error correction and feedback provision on student participation. Master's thesis. Gazi University, Ankara

Journal for the Education of Gifted Young Scientists, 12(2), 83-93, June 2024
e-ISSN: 2149- 360X
jegys.org
dergipark.org.tr/jegys

Young Wise Publishing
youngwisepub.com
gencbilgeyayincilik.com

Research Article

Opinions of parents on their preschool children with gifted potential

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Article Info

Received: 21 March 2024
Accepted: 28 June 2024
Available online: 30 June 2024

Keywords
Early signs of giftedness
Gifted potential
Identification of gifted
Parents' views
Preschool children

Abstract

While there are numerous public centers for gifted children outside of compulsory school hours in Türkiye, facilities for gifted preschoolers remain limited. To address this gap, a consortium of public and civil organizations established Şanlıurfa Gifted and Talented Education Center for children aged 3-6 years, funded by the Ministry of Industry and Technology from 2021 to 2023. This study, one of several academic initiatives within the project, explores parental perceptions of giftedness in young children, comparing views of parents whose children scored within normal and high IQ ranges. Upon the project center's opening, advertisements solicited applications for full-time programs. During the spring semester of 2022, 81 volunteering applicant families completed semi-structured interview forms, explaining how they came to the conclusion that their children were gifted. Subsequently, their children underwent IQ testing, classifying them as either within the normal or potentially gifted group. Researchers conducted content analysis on the initial family responses to identify perceptual differences between families of children with normal and high IQ scores. The analysis revealed several characteristics parents associate with potentially gifted preschoolers, aligning with existing literature. These include language proficiency, curiosity, strong memory, interest in mathematics and foreign languages, musical talent, rapid comprehension, sociability, high attention, logical thinking, and creativity. Notably, many of these traits were also attributed to children scoring within the normal IQ range scores, with exceptions being early reading and writing abilities, leadership skills, and expert opinion. The study concludes that parents of both gifted and typically developing children identify similar indicators of giftedness and subtle differences seem to exist in their perceptions of these traits. Further research is recommended to explore implications for the early identification and support of gifted children. The paper's conclusion discusses the full implications and limitations.

To cite this article:

Göçen, A., Ördek İnceoğlu, S.& Aydemir, F. (2024). Opinions of parents on their preschool children with gifted potential. *Journal for the Education of Gifted Young Scientists*, *12*(2), 85-95. DOI: http://dx.doi.org/10.17478/jegys.1456490

Introduction

During the early stages of education, exceptional talents and abilities may be observed among the preschoolers. The gifted children in the preschool period are defined as those with the potential to perform at high levels due to their advanced or rapid development (Karadağ & Yıldız Demirtaş, 2022). This definition is similar for all age groups of gifted students; "*gifted students are individuals who are recognized for performance that is superior to that of their peers*" (Worrell et al., 2019: 551). Gifted and talented students display or promise an outstanding intellectual ability and are

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capable of extraordinary performance and accomplishment compared to their peers (McClain & Pfeiffer, 2012). For Renzulli (1978), giftedness needs to be redefined to include three elements: above-average intelligence, high levels of task commitment, and high levels of creativity.

Accurate identification of children in terms of their gifts and talents is a vital step in planning services for preschool and kindergarten students. In order to better serve these groups, there are several tools to assess gifted children in the early age groups, such as the Gifted Rating Scales (GRS) by Pfeiffer and Jarosewich (2003), which includes a Preschool/Kindergarten Form (GRS-P) for ages 4:0 to 6:11 and a School Form (GRS-S) for ages 6:0 to 13:11. Another one is Wechsler Preschool & Primary Scale of Intelligence (WPSSI-IV) by Wechsler (2012) covering the ages from 2:6 – 3:11 to 4:0–7:7. As gifted identification process is mainly based on intelligence quotient (IQ), the centers for gifted and academics in the field highlight serious limitations in utilizing only an IQ test score to identify gifted students and urged more comprehensive, multiple and alternative approaches to assess the giftedness (Bildiren et al, 2020; McClain & Pfeiffer, 2012). Thus, IQ tests, parent and teacher observations, opinions, expert examination, and multiple criteria are today the most recounted issues in gifted student research.

Need for Gifted Education in Preschool Period

The literature has a consensus on the need for early identification and intervention for not only developmentally delayed children but also students who show exceptionally high potential or ability in kindergarten age groups (Pfeiffer & Petscher, 2008, p.1). Despite the universal interest in the topic, most early childhood programs are not able to meet the needs of young students with intellectual and/or special talents (Pfeiffer & Petscher, 2008). Providing appropriate learning opportunities to gifted children must be based on their needs as they differ from others (Meador, 1992). Children with a promise of giftedness require a wide variety of educational opportunities that are not found in regular instructional programs (Renzulli, 1978). Based on the work of Piaget, Roeper (1977, p. 391) pinpoints that "*the gifted child becomes an abstract thinker before the child is emotionally able to deal with this understanding,*" which means a standard approach and regular instructional program to these students in the early ages may produce unintended effects on their potential development and progress.

In line with the consensus and need, the States, though less, have started to focus on education for gifted students in preschool periods (Klemme, 2022; Resch, 2014; Mönks & Pflüger, 2005). A burgeoning amount of evidence supports the benefits of quality preschool education for children of all levels, even though early childhood gifted education services rarely exist in preschool centers (Kettler et al., 2017). In answer to these calls abroad and national interest, ŞÜZMER (a Turkish acronym of Şanlıurfa Üstün Zekalılar ve Yetenekliler Eğitim Merkezi) is one of the latest initiatives supported by public and civil organizations in Türkiye that addresses the curriculum development and training of gifted/talented students at early ages with all-day programs serving registered students.

ŞÜZMER is a pilot study for preschoolers in Şanlıurfa/Türkiye. It was founded to serve the directives in 2016 for Science and Art Centers (known as BİLSEM in Türkiye), which are the official education centers for gifted students in Türkiye under the supervision of the Ministry of National Education (MoNE): BİLSEMs are established by the Ministry upon the recommendation of the governorates, taking into account several conditions, with the aim of helping *preschool*, primary, secondary, and high school students with special talents to become aware of their individual abilities and to develop their capacities to the highest level (MoNE, 2016). Despite the inclusion of this provision in the directive for Science and Art Centers, pre-school education units and training services for gifted at these ages were not provided (Dümenci et al., 2017). Science and Art Centers serve the gifted children after a series of tests for students at least 7 years old. ŞÜZMER, being a pilot study for preschool-aged students, is assumed to prepare a solid framework for all other Science and Art Centers if they decide to open pre-school education units.

The Characteristics of Gifted Students

Bildiren (2018) found that gifted children aged 4-6 years displayed characteristics such as early reading abilities, strong memory, mathematical aptitude, curiosity, and high motivation, among several other traits. Curiosity is one of the basic developmental features that help the early child explore the world (Switzky et al., 1974). Strong memory, on the other hand, seems to be closely related to a fluid mind and visual processing intelligence (Gray et al., 2017). Vlahovic-Stetic et

al. (1999) investigated whether gifted children at primary school age (9-10 years old) differ from their normal peers in terms of some characteristics (motivational-emotional variables such as intrinsic orientation towards schoolwork, math anxiety, academic self-esteem, attribution of success and failure in math, and situational interest in math). The results of the study show that gifted children differ from non-gifted children in having a higher internal orientation towards mathematics, lower mathematics anxiety, lower attribution of success to external factors and effort, as well as attributing failure to less external factors (Vlahovic-Stetic et al., 1999). Fast learning is among the features of giftedness (Bahar & Ozturk, 2018; Duan et al., 2010). Children with high verbal ability have significantly higher verbal creative potential (Guignard et al., 2016). Guignard et al. (2016) emphasized in their research that giftedness should be associated with the cognitive domain of talent. The characteristics of giftedness identified long ago by Silverman et al. (1986) are excellent memory, long attention span, early and comprehensive vocabulary development, curiosity, ability to learn quickly, abstract reasoning ability, and recognition of letters in the alphabet at a very early age.

Purpose of the Research

When the characteristics of gifted students are examined based on previous studies, Bildiren et al. (2020: 352) report that gifted children in the preschool period show different characteristics like having complex sentence structure, high verbal skills, rapid learning, having good memory, abstract thinking, answering questions more quickly, the ability to read before age five without direct teaching, high mathematical skills, and longer attention and concentration span. Nevertheless, given the limited research on giftedness during the early childhood years (Inci, 2021), it is plausible that there may exist unexplored characteristics and need for programs pertaining to this age. Consequently, further investigations are required to take fruitful steps forward in defining gifted children in pre-primary education.

IQ tests alone are not very comprehensive in assessing giftedness, so the researchers also planned to see if family responses before the IQ test correlate with the results attained. Thus, the researchers in the study collected family responses prior to the ŞÜZMER selection exam to see whether students show different characteristics as highlighted above: complex sentence structure, high verbal skills, rapid learning, etc., and compare the possible patterns among those who scored the intended points. In line with this, the purpose of this study is to see whether there are distinct similarities or differences among gifted and/or normal children based on the parent's views in comparison to their test results. The research questions are as follows:

- For preschoolers with normal test results, what made their families think their children were gifted?
- For preschoolers with high test results, what made their families think their children were gifted?
- What are the similarities and differences between the perceptions of giftedness among families with children from either group?

Method

Research Model

The main focus of the study is to interpret the families' responses about giftedness in early age groups. Thus, the design of this study was determined as phenomenology, one of the qualitative research methods. According to Moerer-Urdahl and Creswell (2004), phenomenology aims to analyze the common experiences or opinions of individuals about a phenomenon. Here, the researchers aimed to understand families' definitions of giftedness, which were compared after IQ tests.

Participants

The general data regarding children who took part in the selection test are given in Table 1.

Table 1. Demographic data about the participants' children

	Gifted*	Normal
Female	18	20
Male	19	24
Total	**37**	**44**

* Based on test results of WPPSI-IV used by the testers/examiners.

There were 81 applications to ŞÜZMER project in the first phase. The first applicants (mother or father) were asked what makes them think their children are gifted and how they define them. They were also expected to tell any noteworthy and interesting behavior they observed in their children regarding their peers. They were provided an online link with several demographic questions and one open-ended question before the IQ test process in ŞÜZMER. Later, the testers in the study used WPSSI-IV (Wechsler, 2012), an endorsed tool examining intellectual ability in early age groups. The students were grouped as "normal or with gifted potential" based on the test scores specified by the testers.

The answers to the initial family questions are analyzed and presented in Table 2, and some quotes from written responses related to the main findings are presented in Table 3.

Data Collection Tools

The researchers employed a semi-structured interview form to collect opinions of the families with normal and gifted children. A semi-structured interview form containing a single open-ended question was applied to participating parents, along with demographic information regarding them and their children. The question posed is as follows: *"Please explain the characteristics that make you think your child is different from other children (by considering high and normal IQ traits according to your perception)".*

Procedure

ŞÜZMER is a pilot project in Şanlıurfa, a southeastern city in Türkiye, for early-age groups with gifted potential. ŞÜZMER was founded through a pilot project call by Karacadağ Development Agency / SOGEP Program under the auspices of the Ministry of Industry and Technology. ŞÜZMER hosted a series of academic research on giftedness for early ages (See, https://www.suzmer.com/yay%C4%B1nlar), one of which is this study conducted in the first week of students' acceptance into the center. Upon getting registered at the center, all-day education programs were provided in small groups to students, supervised by the co-authors of this study and expert groups from different institutions. The dissemination and sample daily activities of the center during the pilot study can be examined here: https://twitter.com/suzmerr . The project center in Şanlıurfa is shown in Photo 1.

Photo 1. Şanlıurfa Gifted and Talented Education Center (Şanlıurfa Üstün Zekalılar ve Yetenekliler Eğitim Merkezi, ŞÜZMER)

ŞÜZMER was managed by Harran University under the kindergarten of Şanlıurfa Science and Art Center within a separate building dedicated to gifted and talented preschoolers, accepted upon test scores along with family interviews

and examiner/teacher observations. There was a registration announcement for the project ŞÜZMER, for which interested families with children between the ages of 3 and 6 years old could apply. Prior to the test and assessment, the families were asked what characteristics they associate with their children. The written answers were taken, and the family was given an appointment date when teachers/examiners could be present for the selection process.

Data Analysis

The researchers employed content analysis for the written data taken from the families. Through the content analysis, the written data collected from the participants were organized and coded; then the findings were defined and interpreted based on these codes (Yıldırım & Şimşek, 2008). The researchers also grouped families' responses into normal and gifted categories, based on the test results of WPPSI-IV, and constantly compared if there was an overlapping code.

Due to ethical concerns, the information of the participants (families) and their children was anonymized and not requested in the written data. N1, N2... or G1, G2.... represent applicants in natural order upon the test results of their children. N1 means an applicant (parent) to ŞÜZMER center with the child having IQ scores above the threshold (e.g. 135) while G1 means an applicant (parent) to ŞÜZMER with the child having IQ scores below the threshold (e.g. 110). The families were mostly from middle and low-socioeconomic-status groups. The participants' gender is anonymized, and the use of "she" and "he" in Table 3 is random.

Results

The following sections present the characteristics that lead the families to believe their preschool-aged children are potentially gifted. By comparing the initial responses and results after the selection test, the researchers revealed how the characteristics of normal and gifted children seem to differ.

Comparison of Parental Perceptions: Normal vs. Gifted IQ Scores

Table 2 compares opinions between parents of children classified as normal and those classified as gifted based on IQ test scores. The analysis reveals that both groups of parents expressed similar characteristics when describing their children's abilities in the data collection period before the application IQ tests.

Table 2. Results of children with gifted potential and normal - based on parents' opinions

Codes	***Gifted***	***Normal***
Using mother tongue well	19	7
Curiosity	11	13
Strong memory	10	12
Math interest	8	10
Interest in foreign languages	7	5
Music talent	6	2
Fast learning/comprehension	8	9
Social	4	3
High level of attention	3	1
Learning to read and write early	3	-
Logical	3	5
Creativity	3	6
Leadership	3	-
Expert opinion	3	-

Table 2 shows that the frequently expressed variables are similar in both groups, despite a few distinct ones. The general ones are using the native language well, having a strong memory, having an interest in mathematics, fast learning/comprehension, etc... Only the codes of learning to read and write early, leadership and expert opinion were not mentioned by the families of children with normal test scores. Some of these codes attained from the family responses are quoted in Table 3. The family responses were long in some cases, so just the related sentences were quoted and adapted with minor changes in the English language to make sense. Table 3 displays the responses of families, covering some codes attained from content analysis.

Table 3. What makes you think that your child has gifted potential?

Codes	Gifted	Normal
Using mother tongue well	She learned to read on her own at the age of 3. She uses words well (G19).	Very high language and expression skills. He has ability to communicate with older children (N6).
Math interest	His interest in English, numbers and literacy... although we did not teach him, he can recognize and add 3 to 4 digit numbers on his own at this age(G20).	In math, she counts up to 600 and increases by 2, can tell small numbers and big numbers, and the time (N28).
Learning to read and write early	At 18 months, he was speaking very well, he knew counting to 10, at the age of two he could tell colors, shapes and letters.... He learned to read and write short sentences by himself (G18).	-
Logical	He can grasp every concept taught quickly. He can form logical sentences. He learned all the numbers, and some of the letters, of his own accord, without help (G16).	Speaking and reasoning skills, ability to express herself, I think she is beyond her age (N37).
Leadership	He is fond of his freedom, has a leader spirit...He grasps and distinguishes concepts very quickly with his attention and intelligence, he is more resourceful than his peers around him, he successfully solves the education sets of the upper age group (G15).	-
Expert opinion	In general, he gained all his skills earlier than his peers. His emotional intelligence, social intelligence, cognitive intelligence, visual intelligence are very high and above his peers...He is a very curious, interested and excited child. He is especially enthusiastic about hand skills, music and experiments. The sentences I wrote before are the things that his teacher also emphasized, especially his teacher expresses that he is above the children in the class and that he needs better education(G24).	-

Along with some direct quotations taken from the families' answers, as in Table 3, this study pinpoints some messages for researchers, educators, and families.

Although the researchers could not spot a strong coherent pattern between children with gifted and normal potential based on the participants' ideas, there are some main features- learning to read and write early, leadership skills, and expert opinion- which were mentioned by families, though few, just for gifted children confirmed with their test scores. Three families reported that their children learned how to write and read at the age of 3-5 without any family and sibling support. They showed management and leadership skills, which were not expected in this age group by their families. Three parents told their children could be gifted based on different opinions they received from experts, teachers, or pedagogues around them, which were confirmed by the test results in ŞÜZMER project. The expert opinion could be one of the strong indicators of telling children with gifted potential. The test period should surely include a teacher and expert opinion.

Other codes listed under Table 2 were mentioned for both groups but with different weights and frequencies. From a family perspective, the use of smooth and fluent language can be considered a distinctive characteristic in defining preschoolers with gifted potential. Twenty-six parents reported their children exhibited fluency and clarity; they were

told to communicate and interact better with a repertoire of good vocabulary compared to their peers. The dimension of using native language well was emphasized more in the gifted group (n=19).

A music ability could be considered stronger in preschooler children articulating several songs compared to their peers who may song just a few lines; however, an expert could classify a child with music ability based on a musical ear. All in all, based on family responses from a larger perspective, the characteristics in Table 2 seem to be the main characteristics that the community uses in defining gifted persons in society.

The codes from the family responses are consistent with the concepts related to giftedness in the literature. These codes, which signify potentially gifted and talented persons, can be found in the studies and theories associated with gifted literature. The noteworthy aspect of this study is that these characteristics are also explored in 3-6 age groups based on family responses.

Discussion and Conclusion

The parents with gifted and normal test results in the study use similar definitions for their children whom they think to be gifted. Both groups mainly shared similar ideas on their children as seen in Table 2. When the findings obtained from the research are examined, it is seen that the families of both normal and gifted children emphasize the use of language well. A good use of language is more frequently stated for gifted children, which is emphasized in the literature (Bildiren, 2018; Gross, 1993). This may be due to two reasons. The fact that gifted children are developmentally ahead of their peers may help them progress faster in language. On the other hand, language skills can be determined and observed more easily. For this reason, children with good language development may cause a misconception among the family that they are gifted.

Characteristics such as curiosity, strong memory, interest in math, and foreign languages are included in the definitions of gifted potential; the fact that they were used in normal and gifted groups suggests that they may not be sufficiently distinctive in terms of our sample. As a matter of fact, Steiner and Carr (2003) grouped the differences that distinguish gifted and non-talented children under four headings. These are *processing speed, knowledge base, metacognitive skills,* and *problem-solving and strategy ability*. In our study, the characteristics specified by families can be an indication of giftedness, which can be related to the headings of Steiner and Carr (2003). The characteristics stated by the families in our study are the expected developmental features in early childhood (Tuğrul, 2002) as well.

A high level of attention was reported in family responses of both normal and high IQ test-scored students, with families of children with high IQ reporting it more. Web (2007) stated that especially young children have longer attention spans when compared to their normally developing peers. On the other hand, Gomez et al. (2020) focused on the inattention and hyperactivity/impulsivity differences of gifted and non-gifted children with and without ADHD in their recent study. In the aforementioned study, the Wechsler Intelligence Scale for Children, was used. Significant findings were reached in the study conducted with the participation of 359 boys and 148 girls with a mean age of 10.6 (SD=3.08). In the study, gifted/ADHD children tended to be less inattentive than the non-gifted/ADHD group, despite both groups having ADHD diagnosis.

In this study, learning to read and write early, leadership skills and expert opinion about the children were found to be the distinctive features of gifted children. In the sample, some families with gifted children stated that their kids learn to read and write earlier than their peers. Numerous studies support this finding (Bildiren, 2018; Clark, 2002; Gross, 1993). Gross (1993) determined in his study that the reading, comprehension, and fluent reading levels of gifted children are at least 3 years ahead of their ages. He found that 36 out of 40 gifted children started reading before the age of 5. Karnes and Bean (1990) stated that the leadership characteristics commonly seen in gifted children are the desire to challenge, the ability to produce creative solutions to problems, the ability to reason critically, the ability to easily recognize new relationships, flexibility in thought and action, understanding of ambiguous concepts, and motivating others. Among the families participating in our study, those with gifted children emphasized the leadership quality. Early childhood leader children have high verbal skills, sensitive to the others needs and concerns of their (Perez et al., 1982). These kids can easily initiate interactions with peers and adults, and can easily adapt to new situations (Kitano,

1983). When considered in this respect, parents' definition of gifted children with leadership traits is consistent with the literature. Also, some families reported that they did not initially define their children as having high intellect but based on the feedback from their teachers and experts on this topic who observed children's behaviors for some period in the class or office. Thus, it is possible to say early education experts or teachers can distinctly tell the differences between normal and high-IQ students.

In this study, it is seen that the gifted children's good use of their mother tongue (n=19) was repeated many times. This is quite high when compared to their normally developing peers (n=7) in the study. Bucaille et al. (2022) systematically compiled 658 academic studies, examined the cognitive profiles and academic performances of intellectually gifted children in their study, and revealed the weak and strong characteristics of these children. Research results showed that intellectually gifted children do better in attention, language, math, verbal working memory, displacement, and social problem-solving compared to typically developing children. This systematic review study is consistent with this research.

Family members in the sample have noted musical talent as a feature that distinguishes gifted children from their normally developing peers. This feature is more recounted for gifted students in the sample. Children having remarkable skills in the field of music are related to giftedness. Csikszentmihalyi et al. (2014, p.28) state that this is related to easily recognizable musical or mathematical skills. When the literature is examined, it is seen that extraordinary talents in fields such as music, art, and mathematics become visible very early (Olszewski-Kubilius et al., 2003).

The findings of this study suggest that concepts such as mother tongue use, curiosity, strong memory, interest in mathematics, fast comprehension, and creativity, which are generally accepted among the distinguishing features of giftedness, may not be sufficiently distinctive in terms of the sample and age group included in this study. Families of children with normal IQ test scores have repeatedly mentioned the above-mentioned features of gifted children. This could be due to the biased or optimistic perspectives of families toward their children, which are detailed in the limitations part. The perceptions of families regarding "curiosity, strong memory," etc., may have played a subjective role in defining students with gifted potential while learning to read and write early, leadership and expert opinion, though less, were found to be distinctive cases to name early age children as potentially gifted or not.

Recommendations

Research on giftedness covering early education period is very limited compared to older groups. For this reason, it is recommended that researchers develop the literature on this subject to guide pioneering practices in this field.

The families of both potentially gifted and normal students have similar conceptions of giftedness. In future studies, families should be asked to explain in detail the characteristics they expressed for their children. Supporting the statements with detailed experiences will facilitate the understanding of whether the statements of the families can better predict the IQ test results.

Parents' observations about potentially gifted students, whether they have high IQ scores or normal IQ scores, are similar. One of the reasons for this may be that parents consider "any differences" as "a strong sign of giftedness". At this point, sociological research is needed to understand why differences in society are largely attributed to giftedness.

Limitations of Study

There are various limitations that could have manifested in this study, which are explained below.

The parents in the study use similar definitions for their children whom they believe to be gifted. Characteristics such as curiosity, strong memory, and interest in math and foreign languages are among the traits that lead families to think their children have potential for giftedness. These characteristics, which display true indications of giftedness potential, can be interpreted differently based on families' understanding of these concepts. For example, telling the time might be seen as an indication of giftedness for a 3-year-old by one family, while counting to 100 might be considered a sign for a 4-year-old by another family.

Another important issue and limitation in the study is that the participants who applied to ŞÜZMER already believe their children are gifted. This belief may introduce bias, causing them to focus on aspects they associate with giftedness. Along with the self-selection bias, parents who voluntarily applied to the gifted education center may have pre-existing beliefs about their children's abilities, potentially skewing the sample towards those who are more attuned to or actively seeking gifted education.

The study relies heavily on parents' perceptions and descriptions, which may be subject to exaggeration or misinterpretation of their children's abilities. Additionally, the potential influence of the advertisement could be seen in the families. The method of recruiting participants through advertisements for the education center may have influenced how parents described their children's abilities, possibly leading to an emphasis on traits they believed the center was looking for.

Acknowledgment

Şanlıurfa Gifted and Talented Education Center (Şanlıurfa Üstün Zekalılar ve Yetenekliler Eğitim Merkezi, Project No: TRC2/21/SOGEP-UUST/0001), led by Harran University, was funded by Karacadağ Development Agency under the Social Development Support Program (SOGEP) of the Ministry of Industry and Technology of the Republic of Türkiye. Significant support and contributions were provided for this project by the Şanlıurfa Governorship, Şanlıurfa Provincial Directorate of National Education, Haliliye District Directorate of National Education, Şanlıurfa Science and Art Center, Harran Education Cooperative and Young STEM Education and Research Association (Genc STEM Derneği). We extend our gratitude to these institutions, the project team at https://www.suzmer.com/proje-ekibi, and everyone who contributed. The research was conducted in accordance with the ethics approval numbered 2022/82 of the Harran University Social and Humanities Ethics Committee, as stated in the document dated 30.05.2022 and numbered 132599.

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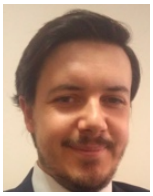

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References

Bahar, A., & Ozturk, M. A. (2018). An Exploratory Study on the Relationship between Creativity and Processing Speed for Gifted Children. *International Education Studies, 11*(3), 77-91. https://doi.org/10.5539/ies.v11n3p77

Bildiren, A. (2018). Developmental characteristics of gifted children aged 0–6 years: parental observations. *Early Child Development and Care, 188*(8), 997-1011. https://doi.org/10.1080/03004430.2017.1389919

Bildiren, A., Sağkal, A. S., Gür, G., & Özdemir, Y. (2020). The perceptions of the preschool teachers regarding identification and education of gifted children. *Ozel Egitim Dergisi*, *21*(2), 351-356.

Bucaille, A., Jarry, C., Allard, J., Brochard, S., Peudenier, S., & Roy, A. (2022). Neuropsychological profile of intellectually gifted children: A systematic review. *Journal of the International Neuropsychological Society*, *28*(4), 424-440.

Clark, B. (2002). *Growing up gifted: Developing the potential of children at home and at school (6th ed.).* Upper Saddle River, NJ: Merrill–Prentice Hall.

Csikszentmihalyi, M., Csikszentmihalyi, M., & Robinson, R. E. (2014). Culture, Time, and the Development of Talent. *The Systems Model of Creativity,* (pp. 27–46). https://doi.org/10.1007/978-94-017-9085-7_3

Duan, X., Shi, J., & Zhou, D. (2010). Developmental changes in processing speed: Influence of accelerated education for gifted children. *Gifted Child Quarterly, 54*(2), 85-91. https://doi.org/10.1177/1932202X14549354

Dümenci, S. B., Gürsoy, F., & Aral, N. (2017). Türkiyede okul öncesi dönemdeki üstün potansiyalli ve üstün zekâlı olan çocukların eğitimleri (Education of Highly Gifted and Gifted Children at Preschool Period in Turkey). *Kastamonu Eğitim Dergisi*, *24*(5), 2469-2480.

Gomez, R., Stavropoulos, V., Vance, A., & Griffiths, M. D. (2020). Gifted Children with ADHD: How Are They Different from Non-gifted Children with ADHD? *International Journal of Mental Health and Addiction*, *18*(6), 1467–1481. https://doi.org/10.1007/s11469-019-00125-x

Gray, S., Green, S., Alt, M., Hogan, T., Kuo, T., Brinkley, S., & Cowan, N. (2017). The structure of working memory in young children and its relation to intelligence. *Journal of memory and language, 92*, 183-201. https://doi.org/10.1016/j.jml.2016.06.004

Gross, M. (1993). *Exceptionally gifted children*. London: Routledge.

Guignard, J. H., Kermarrec, S., & Tordjman, S. (2016). Relationships between intelligence and creativity in gifted and non-gifted children. *Learning and Individual Differences, 52*, 209-215. https://doi.org/10.1016/j.lindif.2015.07.006

Inci, G. (2021). The analysis of research about gifted and talented children at early childhood in Turkey: a study of meta – synthesis. *Journal for the Education of Gifted Young Scientists, 9*(2), 107-121. DOI: http://dx.doi.org/10.17478/jegys.696491

Karadağ, F. & Yıldız Demirtaş, V. (2022). Early literacy skills of gifted children in preschool. *Dokuz Eylül Üniversitesi Buca Eğitim Fakültesi Dergisi,* (53), 212-223.

Kettler, T., Oveross, M. E., & Bishop, J. C. (2017). Gifted education in preschool: Perceived barriers and benefits of program development. *Journal of research in childhood education*, *31*(3), 342-359.

Kitano, M. K., & Tafoya, N. (1983). Preschool leadership: A review and critique. *Journal for the Education of the Gifted, 5*(2), 78-89.

Klemme, M. (2022). Lack of support for gifted children in kindergarten. *European Journal of Research and Reflection in Educational Sciences*, *10*(1), 75-82.

McClain, M. C., & Pfeiffer, S. (2012). Identification of gifted students in the United States today: A look at state definitions, policies, and practices. *Journal of Applied School Psychology*, *28*(1), 59-88.

Meador, K. S. W. (1992). *The effect of synectics training on gifted and nongifted kindergarten students* (Order No. 9227099). Available from ProQuest Dissertations & Theses Global. (304014081). https://www.proquest.com/dissertations-theses/effect-synectics-training-on-gifted-nongifted/docview/304014081/se-2

Moerer-Urdahl, T., & Creswell, J. W. (2004). Using transcendental phenomenology to explore the "ripple effect" in a leadership mentoring program. *International Journal of Qualitative Methods, 3*(2), 19-35

MoNE. (2016). *Bilim ve Sanat Merkezleri Yönergesi (Directive on Science and Art Centers).* Official Gazette of the Ministry of National Education, 2710(79). Retrieved from https://orgm.meb.gov.tr/meb_iys_dosyalar/2017_01/02031535_tebligler_dergisi.pdf.

Mönks, F. J. & Pflüger, R. (2005). *Gifted education in 21 European countries: Inventory and perspective*. Radboud University Nijmegen.

Olszewski-Kubilius, P., Limburg-Weber, L., & Pfeiffer, S. (Eds.). (2003). *Early gifts: Recognizing and nurturing children's talents.* Prufrock Press Inc.

Perez, G. S., Chassin, D., Ellington, C., & Smith, J. A. (1982). Leadership giftedness in preschool children. *Roeper Review, 4*(3), 26-28.

Pfeiffer, S. I., & Jarosewich, T. (2003). *GRS: Gifted rating scales*. Psychological Corporation.

Pfeiffer, S. I., & Petscher, Y. (2008). Identifying young gifted children using the gifted rating scales—Preschool/kindergarten form. *Gifted Child Quarterly*, *52*(1), 19-29.

Renzulli, J.S. (1978). What makes giftedness: Reexamining a definition. *Phi Delta Kappa*n, 60, 180–184.

Resch, C. (2014). National policies and strategies for the support of the gifted and talented in Austria. *CEPS journal*, *4*(3), 9-30.

Roeper, A. (1977). The young gifted child. *Gifted Child Quarterly, 21*(3), 388-396

Silverman, L. K., Chitwood, D. G., & Waters, J. L. (1986). Young gifted children: Can parents identify giftedness? *Topics in Early Childhood Special Education, 6*(1), 23-38.

Steiner, H. H., & Carr, M. (2003). Cognitive development in gifted children: Toward a more precise understanding of emerging differences in intelligence. *Educational Psychology Review, 15*, 215-246. https://doi.org/10.1023/A:1024636317011

Switzky, H. N., Haywood, H. C., & Isett, R. (1974). Exploration, curiosity, and play in young children: Effects of stimulus complexity. *Developmental Psychology, 10*(3), 321.

Tugrul, B. (2002). Features that facilitate learning and teaching in early childhood. *Hacettepe University Faculty of Education Journal,* 22, 142-147.

Vlahovic-Stetic, V., Vidovic, V. V., & Arambasic, L. (1999). Motivational characteristics in mathematical achievement: A study of gifted high-achieving, gifted underachieving and non-gifted pupils. *High Ability Studies*, *10*(1), 37-49.

Webb, J. T. (2007). *A parent's guide to gifted children.* Great Potential Press, Inc.

Wechsler, D. (2012). *Wechsler preschool and primary scale of intelligence—fourth edition*. Pearson.

Worrell, F. C., Subotnik, R. F., Olszewski-Kubilius, P., & Dixson, D. D. (2019). Gifted students. *Annual Review of Psychology*, *70*, 551-576.

Yıldırım, A. & Şimşek, H. (2008). *Sosyal Bilimlerde Nitel Araştırma Yöntemleri* (Qualitative research methods in the social sciences), Seçkin Yayıncılık.

Journal for the Education of Gifted Young Scientists, 12(2), 95-98, June 2024
e-ISSN: 2149- 360X
jegys.org
dergipark.org.tr/jegys

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Interview Article

An interview with Ipek Saralar-Aras: early mathematical scientists

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Article Info

Received: 19 April 2024
Accepted: 30 June 2024
Available online: 30 June 2024

Keywords
Early mathematical scientists
Mathematical giftedness
Mathematics education

2149-360X/ © 2024 by JEGYS
Published by Young Wise Pub. Ltd

Abstract

Mathematical giftedness is a talent area that is rarer than other talent areas. In this regard, understanding mathematical giftedness is very important. Within the framework of these issues, I conducted this interview with a researcher and expert who is also a skilled mathematician. I present to you highly useful and practical information, especially for researchers who are followers of JEGYS. I asked all the questions that could be posed concerning the training of gifted young mathematicians.

To cite this article:

Shaughnessy, M.F. (2024). An interview with Ipek Saralar-Aras: early mathematical scientists. *Journal for the Education of Gifted Young Scientists*, *12*(2), 95-98.

Michael F. Shaughnessy: First, can you tell us a bit about yourself and your education and experience?

Ipek Saralar-Aras: Certainly. I hold a PhD in Education from The University of Nottingham, where I conducted research from 2017 to 2020. Prior to that, I completed my MA in Learning, Technology, and Education at the same institution. My academic journey began with a BSc in Elementary Mathematics Education at Middle East Technical University, Ankara, Turkey, followed by an MSc in Elementary Science and Maths Education. I also have a solid foundation in languages, having achieved an advanced level in English from SC International Languages, Brighton, UK, in 2012, and studied German at Middle East Technical University in 2010. My educational background is complemented by practical experience, including teaching roles at various levels, from elementary to high school, and have also worked as a research assistant at the University of Nottingham and part time lecturer at the Middle East Technical University. My passion lies in identifying and nurturing the mathematical talents of students, helping them reach their full potential.

Michael F. Shaughnessy: How did you first get involved in math and working with mathematically gifted?

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Ipek Saralar-Aras: My interest in mathematics and working with mathematically gifted students began during my post-doctoral studies when I had the opportunity to participate in a research project focused on identifying and supporting gifted learners in mathematics through my study with Prof. Dr. Mine Işıksal Bostan. This experience sparked my curiosity and passion for understanding the unique needs and challenges of gifted students and inspired me to pursue further studies and work in this area. At the time, I also discovered that my son exhibited a remarkable aptitude for music, displaying a keen interest in rhythm and melody. This personal experience not only deepened my understanding of giftedness but also fueled my dedication to exploring various facets of exceptional abilities. It underscored the interconnectedness of talent across different domains and reinforced my commitment to supporting and nurturing gifted individuals in all their diverse forms of expression.

Michael F. Shaughnessy: What should teachers look for in terms of mathematical insight?

Ipek Saralar-Aras: I think teachers should look for a deep understanding of mathematical concepts, the ability to make connections between different mathematical ideas, creativity in problem-solving, and a willingness to explore new approaches and perspectives. Mathematical insight often manifests itself in the ability to see patterns, generalize concepts, and apply mathematical reasoning to real-world situations..

Michael F. Shaughnessy: How can assessment and establishing an individualized plan for each mathematically gifted student be critical?

Ipek Saralar-Aras: I'm relatively new to the world of gifted education. As a newcomer to the field of gifted education, my perspectives are informed by a burgeoning understanding of its principles and practices. While I do not lay claim to expertise in this domain, my evolving insights prompt me to offer opinions grounded in an emergent comprehension of the subject matter. For me, assessment plays a crucial role in identifying the strengths, weaknesses, and learning needs of mathematically gifted students. By conducting comprehensive assessments, teachers can gain insights into students' mathematical abilities, interests, and learning styles, which can inform the development of individualized education plans tailored to their specific needs and goals. These plans can include advanced coursework, enrichment activities, acceleration options, and specialized support services to ensure that gifted students are appropriately challenged and supported in their mathematical learning journey

Michael F. Shaughnessy: Explain how a variety of instructional methods could aid gifted learners of mathematics.

Ipek Saralar-Aras: To the best of my knowledge, gifted learners of mathematics benefit from a variety of instructional methods that cater to their diverse learning needs and interests. This may include problem-based learning, inquiry-based learning, project-based learning, collaborative learning, independent study, and the use of technology-enhanced instruction. These methods provide opportunities for gifted students to engage in deep exploration, critical thinking, and creative problem-solving, allowing them to develop their mathematical talents.

Michael F. Shaughnessy: Describe how enrichment and grouping benefit gifted learners.

Ipek Saralar-Aras: I believe that enrichment activities and flexible grouping arrangements are essential components of effective programming for gifted learners in mathematics. Enrichment activities provide opportunities for gifted students to explore advanced topics, pursue independent projects, and participate in competitions and extracurricular activities that extend their mathematical knowledge and skills beyond the standard curriculum. Flexible grouping allows gifted students to work with peers who share similar interests and abilities, providing opportunities for collaboration, peer support, and intellectual challenge.

Michael F. Shaughnessy: In what ways can grade-skipping (or acceleration) and technology allow students to work with advanced concepts?

Ipek Saralar-Aras: Grade-skipping or acceleration may allow mathematically gifted students to progress through the curriculum at a faster pace, enabling them to work with advanced concepts and engage in more challenging coursework that is commensurate with their abilities. Technology plays a crucial role in facilitating accelerated learning by providing

access to online resources, digital simulations, virtual learning environments, and adaptive software that offer personalized instruction and enrichment opportunities tailored to students' individual needs and interests.

Michael F. Shaughnessy: What encompasses a nurturing environment for the development of mathematically gifted students?

Ipek Saralar-Aras: To my understanding, a nurturing environment for the development of mathematically gifted students is one that values intellectual curiosity, fosters a growth mindset, celebrates diversity, and promotes a culture of excellence in mathematics. It provides opportunities for students to engage in challenging and meaningful mathematical tasks, receive personalized support and encouragement from teachers and peers, and participate in a variety of enrichment activities and extracurricular programs that stimulate their intellectual curiosity and passion for mathematics.

Michael F. Shaughnessy: What provisions are there in your country for mathematically gifted scientists?

Ipek Saralar-Aras: In my country, Türkiye, provisions for mathematically gifted scientists include specialized educational programs, summer camps, competitions, mentorship opportunities, and research internships offered by universities, research institutions, professional organizations, and government agencies. These programs aim to identify and nurture the talents of gifted students in mathematics and provide them with opportunities to pursue advanced study and research in STEM fields.

Michael F. Shaughnessy: How do you assist and counsel parents of mathematically gifted?

Ipek Saralar-Aras: I work as a national education expert so I do not have immediate access to the parents of mathematically gifted. As far as I know, in Türkiye, the assistance for parents are typically undertaken by teachers and academics in the field of gifted education. These professionals provide assistance and guidance to parents of mathematically gifted students by furnishing them with pertinent information and resources regarding gifted education, advocating for the educational and socio-emotional requirements of their children, engaging in collaborative efforts to formulate personalized educational strategies, and furnishing ongoing support to navigate the complexities and potentials of nurturing a gifted child. Additionally, they facilitate effective communication and cooperation among parents, educators, and other stakeholders to ensure that gifted learners receive the requisite support and enrichment opportunities for their holistic development

Michael F. Shaughnessy: Is there some relationship between intelligence and mathematically gifted?

Ipek Saralar-Aras: As an individual recently immersed in the realm of gifted education, I believe that while intelligence is certainly a factor in mathematical giftedness, it is not the sole determinant. Mathematically gifted individuals often possess a unique combination of cognitive abilities, including mathematical reasoning, spatial visualization, pattern recognition, and creative problem-solving skills, that enable them to excel in mathematics. However, giftedness is multifaceted and can manifest in various ways across different domains, so it's essential to consider a range of factors when identifying and supporting mathematically gifted students.

Michael F. Shaughnessy: Is there some relationship between personality and mathematical attainment?

Ipek Saralar-Aras: There is some evidence to suggest that certain personality traits, such as persistence, curiosity, openness to experience, and a willingness to take risks, may be associated with higher levels of mathematical attainment. Individuals who exhibit these traits are often more motivated, engaged, and resilient in their mathematical learning and are more likely to pursue advanced study and research in mathematics. However, personality is just one of many factors that can influence mathematical attainment, and the relationship between personality and mathematical ability is complex and multifaceted.

Michael F. Shaughnessy: Calculus I, II, III and IV seem to be the pinnacle of mathematics in the US Is this the same in Europe and your part of the world?

Ipek Saralar-Aras: In many European countries including Türkiye, calculus is indeed considered a cornerstone of advanced mathematics education, and courses in calculus are typically offered at the middle school, high school or undergraduate level as part of the standard mathematics curriculum. However, the structure and content of mathematics education may vary from country to country, and different educational systems may place varying degrees of emphasis on calculus and other branches of mathematics depending on their cultural, historical, and pedagogical priorities.

Michael F. Shaughnessy: What have we neglected to ask?

Ipek Saralar-Aras: One important question that you haven't asked is about my philosophy of gifted education and how it informs my approach to teaching and working with gifted students. My philosophy centers on the belief that every student has unique talents and potential that deserve to be recognized, nurtured, and celebrated. I believe in providing gifted students with challenging and enriching learning experiences that foster intellectual curiosity, creativity, and a love of learning, while also supporting their social-emotional well-being and personal development. I would also like to thank you for the opportunity to share my insights and experiences on working with gifted students. I appreciate your thoughtful questions and the chance to discuss this important topic. If you have any further inquiries or need additional information, please don't hesitate to reach out. Thank you again for considering me for this interview.

Biodata of Ipek Saralar-Aras

Dr. **İpek Saralar-Aras**, who has a bachelor's and master's degree in Mathematics Teaching from METU, completed her second master's degree in educational technologies in England. In the meantime, she started working as a research assistant at the University of Nottingham and continued her job until he completed his doctoral education. Saralar-Aras, who completed her doctorate in the field of technology use in mathematics education in England, has been working as a National Education Specialist at the Ministry of National Education, General Directorate of Innovation and Educational Technologies, Department of Educational Technologies and Projects, as of July 2, 2020. In addition, she continues to work as a part-time lecturer in METU Mathematics Teaching Department when needed**.**

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Journal for the
Education of
Gifted
Young Scientists

Young Wise Publishing

ISSN: 2149-360X