



Methodological trends of theses on gifted and talented children in science education in Turkey, 2015-2022

Zeynep Betül Çetin¹ Kütahya Dumlupınar University, Faculty of Education, Department of Science Education
Kütahya, Turkey. 

Gamze İnci, Kütahya Dumlupınar University, Faculty of Education, Department of Education for Special Talents
Kütahya, Turkey. 

Suggested Citation:

Çetin, Z. B. & İnci, G. (2023). Methodological trends of theses on gifted and talented children in science education in Turkey, 2015-2022. *Journal of Education and Special Education Technology*, 8(1), 86-97. <https://doi.org/10.18844/jeset.v8i1.8440>

Received from December 01, 2022; revised from December 23, 2022; accepted from April 26, 2023.

Selection and peer review under the responsibility of Prof. Dr. Adile Aşkı Kurt, Anadolu University, Turkey.

©2023 by the authors. Licensee Birlesik Dünya Yenilik Arastırma ve Yayıncılık Merkezi, North Nicosia, Cyprus.

This article is an open-access article distributed under the terms and conditions of the Creative Commons Attribution (CCBY) license (<https://creativecommons.org/licenses/by/4.0/>).

Abstract

This study aims to determine the methodological trends of postgraduate theses on gifted education published in Turkey's department of science education. In the study, the theses accessible till 2015 (1 January) and 2022 (1 October) at the National Thesis Center of YOK (Higher Education Institution) were examined. In the analysis, 56 postgraduate studies were included. We conducted the research according to the document analysis. The investigated theses were categorized by year, type, technique and design, institution, sampling method, analytic method, and data collection instrument. The "Methodical Disposition Analysis Form" created by the researchers was utilized as a data collection instrument within the scope of the study. The form data was evaluated using descriptive statistical methods and presented in frequency tables. According to the research findings, most researchers are master's theses, and most publications were made in 2019. Inonu University has the highest number of postgraduate studies in science education. While the qualitative method is preferred in almost half of the studies, the most preferred pattern is a case study. The easily accessible sampling method was determined as the most used sampling method. While the content analysis was the most used, interviews were the most preferred data collection tool in the analysis method.

Keywords: Giftedness, Talent, Gifted and Talented Student, Science Education, Methodical Tendency

* ADDRESS FOR CORRESPONDENCE: Zeynep Betül Çetin, Kütahya Dumlupınar University, Kütahya, Turkey
E-mail address: zeynep.cetin@dpu.edu.tr

1. INTRODUCTION

There is quantitative and qualitative growth in the number of postgraduate studies in the field of science gifted in our country. Gifted students have talents, interests, and skills that differ from their peers. The different abilities of these students also necessitate research in various disciplines in the field of giftedness. One of the most important of these disciplines is undoubtedly the field of science education. The interest and abilities of gifted students in scientific processes are emphasized in many studies in the literature. For this reason, many postgraduate studies are carried out in our country in science education, including gifted children.

Literature review in scientific research; It is essential for determining the subject of this research, the needs of the literature, the quality of the new study to be conducted, and its contributions to the literature. This research is essential for assessing the methodological tendencies of postgraduate theses prepared for teaching talented students in science education departments and guiding future research.

Researchers believe discovering the methodological trends of scientific studies and the changing/transforming/developing situation in the relevant science through time to be beneficial in creating a significant bibliography for determining the technique and subject of their research. In reality, the methodological preferences and scientific reporting approaches of scientific studies such as theses and articles are beneficial for introducing novice researchers to the culture of scientific research. This study presents meaningful information about the research methodologies currently used in related research to individuals who will research gifted students in science education. For these reasons, international (Berge & Mrozowski, 2001; Rourke & Szabo, 2002; Zawacki-Richter et al., 2009) and national (Atalay, 2018; Bolat and Tekin, 2017; Erdem Aydin et al., 2019; Horzum et al., 2013; İnci, 2021; Karadağ, 2010; Öksüz et al., 2011; Şahin et al., 2011; Şahin et al., 2013; Şimşek et al., 2008) in the literature, there are studies examining the methodological trends of research in different disciplines.

This study aims to assess the postgraduate theses prepared for the education of gifted students in the field of science education in terms of their methodological tendencies and to give scientific data on the field's requirements for conducting scientific research. This study aims to assess the research conducted on talented children in science education in our nation from a methodological standpoint and to identify the overall trend in this sector. In keeping with this primary objective, the following research questions were investigated.

The purpose of this research is to examine the postgraduate theses prepared for the education of gifted students in the field of science education in terms of their methodological tendencies and to present scientific data on the needs of the field for scientific research to be conducted. This study was carried out in line with this primary purpose; this study aims to examine the research on gifted students in science education in our country from a methodological point of view and to reveal the general trend in this field. In line with this primary purpose, answers to the following research questions were sought.

1.1. Research Questions

- 1) What is the distribution of the theses made in the field of gifted science education in Turkey between 2015-2022?
- 2) What is the distribution of theses made in the field of gifted science education in Turkey between 2015-2022 according to types?
- 3) How is the distribution of the theses made in the field of gifted science education in Turkey between 2015-2022 according to the method?

- 4) What is the distribution of theses made in the field of gifted science education in Turkey between 2015-2022 according to patterns?
- 5) What is the distribution of the dissertations made in the field of gifted students in science education in Turkey between 2015-2022, according to the universities?
- 6) How is the distribution of the theses made in the field of gifted science education in Turkey between 2015-2022 according to the sampling method?
- 7) How is the distribution of the theses made in the field of gifted science education in Turkey between 2015-2022 according to the analysis method?
- 8) What is the distribution of theses made in the field of gifted science education in Turkey between 2015-2022, according to data collection tools?

2. METHOD

This section of the research includes the research design, the studied materials, the collection of data, the development of data collection tools, and the analysis of the results.

2.1. Methodology and Research Design

The pattern of document analysis was used for the research based on the qualitative research methodology. Yıldırım and Şimşek (2018) describe document review as the handling, review, and questioning of various papers that contain information about the phenomenon or events under investigation and serve as its data source. In this study, graduate theses served as the source documents.

2.2 Selection of Documents

In the study, a systematic analysis of postgraduate theses on giftedness in science education was done between 1 January 2015 and 1 October 2022. Inclusion and exclusion criteria have been set for the examination of graduate theses. The YOK (Higher Education Institution) database was scanned using the advanced search option. In the search terms section, the terms "giftedness," "talented," and "gifted and talented" were written as key words. The field to search is marked as "all." The search type is selected as "contain it." The year is limited to between 2015 and 2022. The permission status is selected as "allowed" and the status "approved." After the search, 70 graduate theses were accessed. Theses were randomly ordered and coded as T1, T2... (Tn).

As a result of the examination, T3 and T46 coded theses are biology teaching, T7, T8, and T20 coded theses are teaching chemistry, T22, T34, T38, T40, T48, T57, T65, and T66 coded theses are teaching mathematics, T28 coded thesis is teaching physics. Moreover, it was excluded from the postgraduate theses to be examined. Fifty-six graduate theses belonging to the department of science teaching were selected for examination.

2.3 Data collection tools

Methodical Trend Evaluation Form

The researchers developed the Methodical Tendency Review Form to collect data for the study. During the development of the form, numerous variables were determined by examining the pertinent literature. The form's purpose is to evaluate theses based on eight variables: year, type, method, design, university, sampling technique, analytic method, and data-gathering instruments.

2.4. Data Analysis

After accessing the YOK (Higher Education Institution) database to get the studied graduate theses, the theses were randomly distributed and assessed by two independent researchers by the Methodological Tendency Review Form. After the examination, two researchers scrutinized and analyzed theses until a complete agreement was established. Thus, the accuracy of the data analysis

was guaranteed. As a consequence of the examination, the data were analyzed using descriptive statistical methods such as percentage and frequency and displayed in tables.

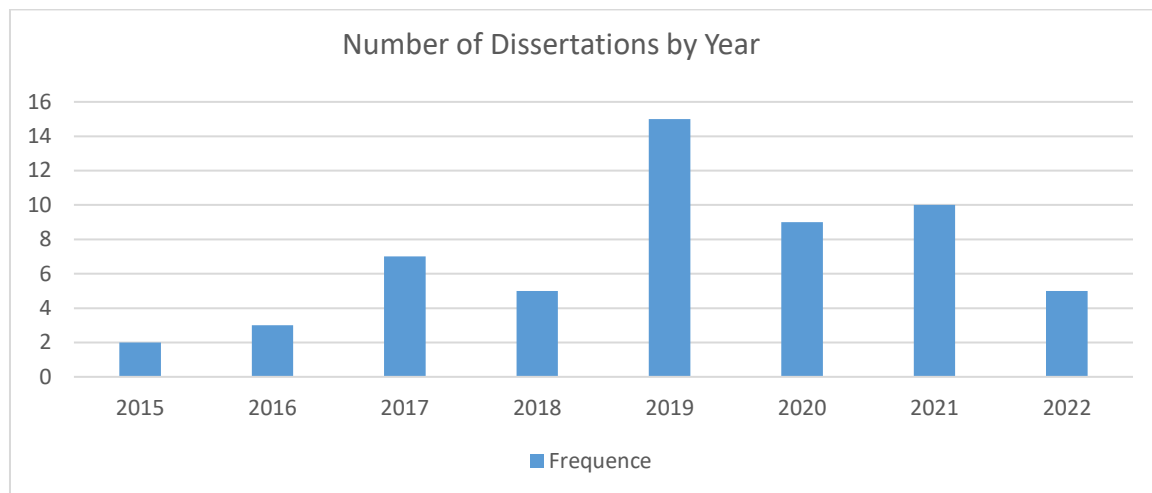
3. FINDINGS

3.1. Number of Dissertations by Year

Examining the distribution of the postgraduate theses analyzed within the scope of the study reveals that 15 postgraduate theses were completed in 2019 alone. In addition, seven theses were written in the relevant field in 2017 and ten in 2021, respectively. According to Figure 1, the number of articles published annually fluctuates over time. It is believed that the number of studies on gifted children in science education has increased in recent years and that this trend will continue.

Figure 1.

Number of Dissertations by Year

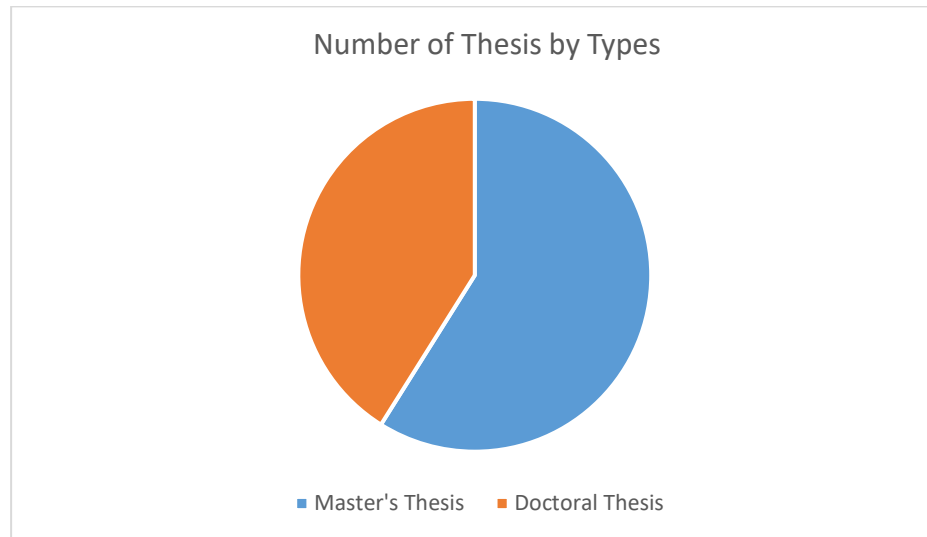


3.2. Number of Theses by Type

Figure 2. shows the distribution of postgraduate studies on gifted children in the field of science education in Turkey by thesis type. According to Figure 2., 33 of the 56 studies were carried out at the master's level and 23 at the doctoral level. This shows that graduate studies related to gifted students in the field of science education are numerically higher than doctoral studies.

Figure 2.

Number of Theses by Types



3.3 Institutional Distribution of Theses

The distribution of theses on gifted children in science education is presented in Table 1. This study assessed a total of 56 dissertations about brilliant children in the field of science education from 25 different state universities. Gazi University and İnönü University appears to be the primary institution for studies in the relevant topic.

Table 1.

Distribution of Theses by Institutions

University	f
Yıldız Technical University	4
Gazi University	5
Alanya Alaaddin Keykubat University	2
Hacettepe University	2
İnönü University	7
Karadeniz Technical University	2
Sakarya University	3
Balıkesir University	2
Erciyes University	4
Bolu Abant İzzet Baysal University	2
Konya Necmettin Erbakan University	2
Atatürk University	1
Muğla Sıtkı Koçman University	2
Amasya University	3
Manisa Celal Bayar University	1
Trabzon University	1
Aydın Adnan Menderes University	1

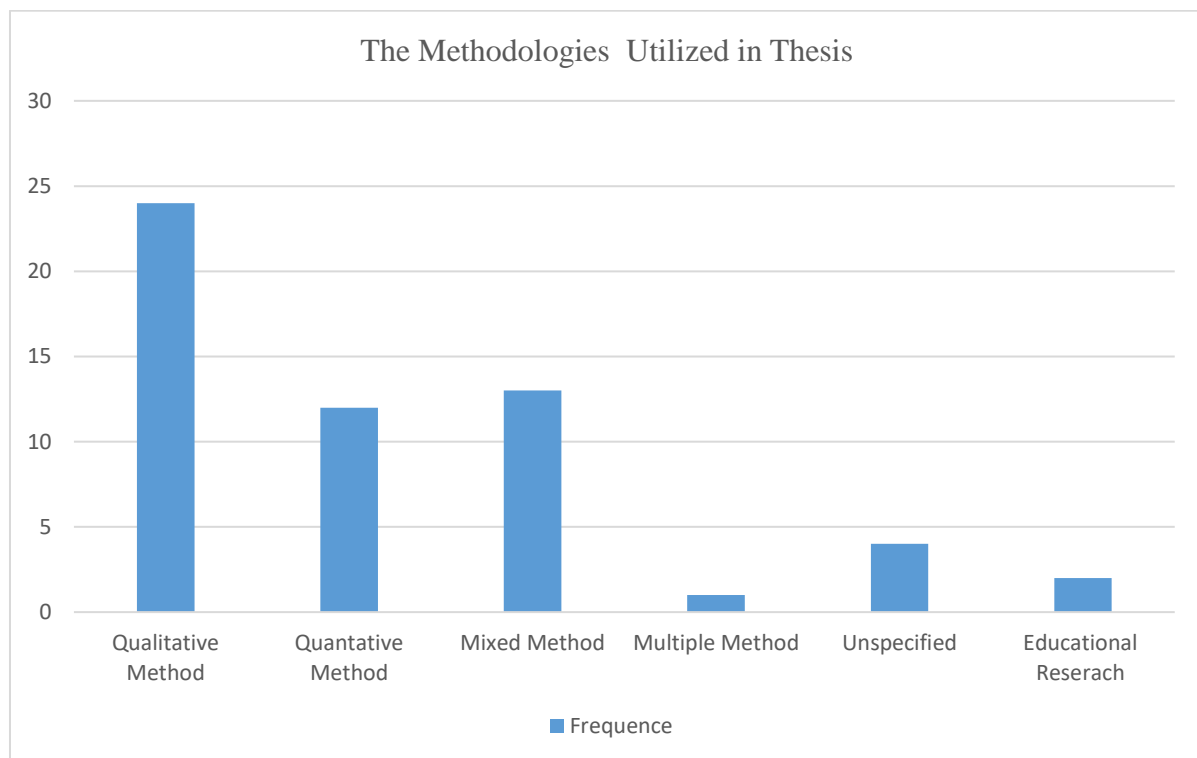
Uşak University	2
Binali Yıldırım University	1
Pamukkale University	1
Ege University	1
Recep Tayyip Erdoğan University	1
Middle East Technical University	1
Uludağ University	3
Kocaeli University	2

3.4. The methodologies utilized in thesis

Figure 3 depicts the distribution of talented children theses in science education according to research methodology. Twenty-four research on gifted children in science education was conducted using the qualitative method, as shown in Figure 3. This indicates that over half of the research consists of qualitative studies. In addition, mixed research reveals that it is highly favored. Furthermore, methodologies such as multiple models and educational research design have begun to be utilized in recent studies.

Figure 3.

The methodologies utilized in thesis



3.5. The design utilized in thesis

Table 2 shows the distribution of patterns used in theses about gifted children in science education. According to Table 2, the most preferred design in qualitative studies is case study, while descriptive survey (n=6) design is primarily used in quantitative studies. Another critical point that draws attention to the table is that almost half of the mixed-method research did not specify a specific design.

Table 2.

The Design Utilized in Thesis

Method Type	Pattern Type	f
Qualitative Research	Case	14
	Phenomenology	6
	Action	3
	Self-assessment	1
	Grounded Theory	4
Quantitative Research	Experimental	5
	Descriptive	6
	Relational Screening	4
	Correlational	1
Mixed Method Research	Unspecified	6
	Coverging Parallel Pattern	3
Multiple Method Research	Case	1
	Experimental	1

3.6. Preferred Sampling Method

Table 3 shows the distribution of theses about gifted children in science education by sampling type. According to Table 3, the most accessible/convenient sampling (n=16) and purposive sampling (n=15), the random sampling method, was preferred the most in the studies on gifted children in science education. Another great point in the table is that the sampling method needed to be explained in 14 postgraduate studies.

Table 3.

Preferred Sampling Method

Sampling Method	f
Unspecified	14
Purposive Sampling	15
Accessible/convenient Sampling	16
Cluster Sampling	1
Random Sampling	3
Typical Case Sampling	2
Maximum Variation Sampling	3
Criterion Sampling	2

3.7. Data Collection tools

In scientific education, the range of data collection instruments used in dissertations about gifted children is depicted in Table 4. According to Table 4, interviews (n=34) are the most common data collection method in studies on gifted students in science education. Scale/Test (n=29), Developed Product/text/worksheet/homework (n=13), and Journal (n=13) were cited as respondents' most favored data-gathering instruments following the interview.

Table 4.

Data Collection tools

Data Collection Tool	f
Scale/ Test	29
Observation	12
Meeting	34
Questionnaire	8
Product development/Handout/Homework	13
Daily	13
Rubric	1
Control List	1
Life Story	1
Video/Voice Notes	3
Achievement Test	10
Metaphor	1
Researcher Notes (memo)	1
Self Assessment Form	1

3.8. Data Analysis Techniques

In science education, the distribution of data-gathering instruments in theses about gifted students is depicted in Table 5. Examining the data analysis methods of the investigated theses reveals that content analysis (n=25), one of the qualitative analysis methods, is the most frequently employed analysis approach. However, descriptive statistics is the most commonly used method (n=14) for quantitative data analysis types. It is observed that structural equation modeling and continuous comparative data analysis are the least utilized methods in quantitative studies. At the same time, the narrative technique is the least utilized approach in qualitative investigations.

Table 5.

Data Analysis Techniques

Analysis Techniques	f
Unspecified	3
Content Analysis	25
Thematic Analysis	3
Descriptive Statistics (Quantitative)	14
Willcoxon Sum of Signed Rows	6
Narrative Techniques	1
Descriptive Analysis (Qualitative)	14
MANOVA	2
Correlation	3
T Test	10

Mann Whitney U	7
Kruskal Wallis	6
ANOVA	5
Factor Analysis	2
Regression	3
Structural Equation Model	1
Constant Compative Data Analysis	1

4. DISCUSSION-CONCLUSION-SUGGESTIONS

The research analyzed postgraduate theses on the gifted in scientific education in a methodological dimension. The findings connected to each research issue were assessed through a literature review, discussed with the data from related studies, and recommendations were made. The debate is given with paragraphs that correspond to the research questions.

In the research that examines the methodological tendencies of postgraduate theses written for gifted and talented students in science education, a rising graph can be found since 2015 when comparing the number of theses across the years. In 2019, 15 dissertations reached the highest value. This situation can be regarded as a sign that, throughout time, scientific professors have developed an interest in gifted kids' studies. The value of theses written in 2022 is anticipated to increase by the end of the year. According to the research undertaken by Kömek and Özsevgeç (2014), there were no studies in this sector in 2002 and 2003, but the number of studies has increased steadily since 2004. It is anticipated that both the number of researchers and the number of studies in this sector will expand.

Analyzing theses by type reveals that there are more master's theses (33) than doctorate theses (23). It is estimated that the number of master's programs in our country is greater than the number of doctoral programs; hence, the number of master's theses is quantitatively more significant. In the studies conducted by Bolat and Tekin (2017) and Koc and Saranlı (2017), it is evident that master's theses are more extensive than doctoral theses and exhibit a correlation with the study's data. In the study by Kömek and Özsevgeç (2014), which investigated the number of postgraduate theses written on the topic of giftedness in science education between 2001 and 2013, 86% were written. According to our survey, this percentage was 59%. This demonstrates that gifted students in science education are being investigated more in Ph.D. dissertations than in past years.

When the theses are ranked according to the institutions, İnönü University ranks first with seven theses, followed by Gazi University with five theses, Yıldız Technical University, and Erciyes University, each with four theses. Since these colleges employ science educators in the subject of special education, it is predicted that there are several studies in this area.

Examining the methodology upon which theses are built reveals that qualitative methods predominate. In recent years, the trend toward qualitative research has also increased in scientific education. The employment of quantitative and mixed methodologies is also evident. In several dissertations, the procedures need to be disclosed. Studies by Bolat and Tekin (2017), Koc and Saranlı (2017), and Kömek and Özsevgeç (2014) were analyzed prior to 2015-2017, and it was discovered that the quantitative method gained prominence. In light of this, the qualitative method has begun to gain prominence in the study undertaken in recent years. According to Babur et al. (2015), qualitative research is consistent with the study's findings.

Analyzing the patterns adopted by theses reveals that the majority need to specify the most prevalent case study design in qualitative research, descriptive survey design in quantitative research, or mixed method research design. This may be owing to the fact that mixed methods research is an emerging topic that has only recently begun to be examined. The many model method includes the

scenario and experimental design. According to Bolat and Tekin (2017), descriptive and scanning designs are utilized in quantitative research, while case studies and historical designs are utilized frequently in qualitative research. Similarly, it has been noticed that the design needs to be more defined in research that utilizes mixed methods. This circumstance parallels the findings of the study.

When examining the chosen sample methods in theses, it is evident that the most preferred approach is the most accessible/convenient. Second, systematic sampling was employed. In the majority of theses, the sampling method is not disclosed. This circumstance has been identified as a factor that researchers should investigate and develop. In the study by Bolat and Tekin (2017), frequent use of systematic sampling is observed, whereas, in the study conducted by Koc and Saranlı (2017), frequent use of purposive sampling is observed.

On examining the data gathering methods utilized in theses, it was discovered that interviews were the most prevalent. Since theses predominantly employ the qualitative technique, the interview is also a common data gathering instrument for qualitative research. In qualitative research, interviews, and quantitative research, Bolat and Tekin (2017) and Komek and Ozsevgeç (2014) found that test/scale data collection tools are the most often employed. This demonstrates that researchers have not evolved their data collection methods over time.

It is seen that the content analysis method is the most common among the data analysis methods used in theses. Descriptive statistics, descriptive analysis, and T-tests are also among the frequently used analysis methods. In the studies conducted by Bolat and Tekin (2017) and Komek and Ozsevgeç (2014), t-tests and descriptive statistical techniques are frequently used in quantitative research, and content analysis is frequently used in qualitative methods. Babur et al. (2015) also found that descriptive analysis, content analysis, and T-test were the most widely used analysis methods. In this case, it has been observed that researchers have used similar analysis methods over the years and that these methods have not diversified.

As a result, in recent years, there has been an exponential surge in interest in as a result study on gifted education in science education. However, research can observe an apparent move to the qualitative paradigm. It demonstrates parallelism with the paradigm change within the social sciences. This is because the research focuses solely on studies in the field of science education. While quantitative investigations are conducted in the physics, chemistry, and biology departments, the studies conducted in the science education departments' move away from positivism. The study's findings can be used to rigorously focus future research in the field of science education for gifted students. Expanding the study with article-style science education research for gifted children is possible. The number of studies assessing the methodological tendencies of studies on gifted children and science education research in many domains should be increased. In recent years, the trend toward qualitative and quantitative methods has shifted. Examine the repercussions of this predicament in numerous fields. In addition, it is suggested to expand the study on the mixed method, which has been examined in recent years and to boost the resources that give researchers access to information on the mixed method. In addition, the fact that the sampling procedure was not indicated in the majority of studies demonstrates a lack of expertise on the part of the researchers, which should be remedied. In future studies, postgraduate theses and other studies on this topic can be evaluated in terms of additional variables.

REFERENCES

- Atalay, A. (2018). Research Models Used in Doctoral Theses on Sport Management in Turkey: A Content Analysis. *Universal Journal of Educational Research*, 6(3), 541-555. DOI:10.13189/ujer.2018.060317

- Çetin, Z. B. & İnci, G. (2023). Methodological trends of theses on gifted and talented children in science education in Turkey, 2015-2022. *Journal of Education and Special Education Technology*, 8(1), 86-97. <https://doi.org/10.18844/jeset.v8i1.8440>
- Babur, A., Kiper, A., Çukurbaşı, B., Albayrak-Özer, E., Tonbuloğlu, İ., Küçük, Ş., Demirhan, E., Canan-Güngören, Ö., Kırıyıcı, M., Horzum, M.B. (2015). Examine of Methodological Aspects of Articles in the Journal of Distance Education Year 2009-2013, *Sakarya University Journal of Education*, (6,1), (123-140). <https://doi.org/10.19126/suje.70220>
- Berge, Z. ve Mrozowski, S. (2001). Review of Research in Distance Education. *American Journal of Distance Education*, 15(3), 5-19. <https://doi.org/10.1007/s12528-011-9045-8>
- Bolat, Y., & Tekin, M. T. (2017). Trends in research training of gifted: A methodological analysis1. *International Journal Of Eurasia Social Sciences* , 8(27), 609-629. info:eu-repo/semantics/openAccess
- Erdem Aydın, İ., Bozkaya, M., & Genc Kumtepe, E. (2019). Research Trends and Issues in Educational Technology: Content Analysis of TOJET (2012-2018). *Turkish Online Journal of Educational Technology-TOJET*, 18(4), 46-61. https://www.researchgate.net/publication/288349426_Research_trends_and_issues_in_educational_technology_A_content_analysis_of_tojet_2008-2011
- Horzum, M. B., Özkaya, M., Demirci, M., ve Alpaslan, M. (2013). Review of Turkish Distance Education Research, *Inonu University Journal of The Faculty of Education*, 142, 1-12. <https://dergipark.org.tr/tr/pub/inuefd/issue/8693/108602>
- İnci, 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. <http://dx.doi.org/10.17478/jegys.696491>
- Karadağ, E. (2010). Research Models Used in Doctoral Dissertations in the Area of Education Sciences in Turkey: Quality of Research and Analytical Errors. *Educational Administration: Theory and Practice*, 16(1), 49-71. <https://dergipark.org.tr/tr/download/article-file/108243>
- Kömek, E., Özsegeç, T. (2014). Türkiye'de Üstün Yeteneklilerin Fen Eğitimi Üzerine Yapılan Tezlerin İçerik Açısından İncelenmesi, *11.Ulusal Fen Bilimleri ve Matematik Eğitimi Kongresi*. https://www.researchgate.net/publication/286932608_Turkiye%27de_Ustun_Yeteneklilerin_Fen_Egitimi_Uzerine_Yapilan_Tezlerin_Icerik_Acisindan_Incelenmesi
- Koç, F., Saranlı, A.G. (2017). A Multi Dimensional Analysis of Graduate Studies in Turkey Focusing on Gifted Children in Early Childhood Period, *Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi*, (41), (163-183). <http://doi.org/10.21764/efd.81302>
- Öksüz, Y., Barut, Y., Dicle, A.N. (2011). Eğitim bilimleri enstitüsünde yapılan tezlerin çeşitli yönleriyle incelenmesi. *Samsun Sempozyumu: Samsun'a Bir Parantez Açıyoruz*, (13-16 Ekim 2011), Samsun. <https://doi.org/10.12984/eed.49993>
- Rourke, L. ve Szabo, M. (2002). A Content Analysis of the Journal of Distance Education 1986-2001. *International Journal of E-Learning & Distance Education*, 17(1), 63-74. <https://eric.ed.gov/?id=EJ661363>
- Şahin, M., Yıldız, D.G., Duman, R. (2011) An Evaluation of the Theses on Social Studies Education in Turkey. *Journal of Social Studies Education Research*, 2(2), 96-121. <https://dergipark.org.tr/tr/download/article-file/179020>
- Şimşek, A., Özdamar, N., Becit, G., Kılıçer, K., Akbulut, Y., & Yıldırım, Y. (2008). [Current trends in educational technology research in Turkey]. *Selçuk University Journal of Social Sciences Institute*, 19, 439-458. <https://dergipark.org.tr/tr/download/article-file/1723975>
- Şahin, E. Y., Kana, F., & Varışoğlu, B. (2013). The research trends of postgraduate dissertations in Turkish education departments. *Journal of Human Sciences*, 10(2), 356-378. <https://j-humansciences.com/ojs/index.php/ijhs/article/view/2671/1189>

Çetin, Z. B. & İnci, G. (2023). Methodological trends of theses on gifted and talented children in science education in Turkey, 2015-2022. *Journal of Education and Special Education Technology*, 8(1), 86-97. <https://doi.org/10.18844/jeset.v8i1.8440>

Yıldırım A. Şimşek H. (2018). Sosyal bilimlerde nitel araştırma yöntemleri. (11, 189-201). Seçkin Yayınevi.

Zawacki-Richter, O., B~cker, E. M. & Vogt, S. (2009). Review of Distance Education Research (2000 to 2008): Analysis of Research Areas, Methods, and Authorship Patterns. *International Review of Research in Open & Distance Learning*, 10(6). <https://doi.org/10.19173/irrodl.v10i6.741>