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THEMATIC REVIEW OF GRADUATE THESES PUBLISHED IN TURKIYE ABOUT 21ST-CENTURY SKILLS

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ABSTRACT

The purpose of this study is to carry out a thematic review of graduate theses published in Türkiye about 21st-century skills. The thematic review process, a holistic perspective on 21st-century skills will be provided and it will guide researchers who want to research on the subject. According to the fact that the graduate theses are published by the National Thesis Centre in Türkiye, a total of 133 graduate theses were reached. In the study in which the document analysis method was used, graduate theses were analysed using the analysis matrix. In the analyses matrix, there were seven themes: year and type, region of publication, subject, preferred approach type, method and model used, research group/sample/participant group, and emphasised results. When the obtained data were analysed, it was found that the number of graduate theses published in Türkiye about 21st-century skills has increased significantly in the last three years; a higher number of graduate theses were published in Central Anatolia and Marmara Regions; graduate theses conducted to determine the relationship between variables/demographic variables and teaching methods and techniques with these skills have a high rate in the subject area; the number of theses based on quantitative approach is higher than the number of theses based on other approaches; the number of theses in which descriptive research methods are preferred differs significantly from the number of theses in which other research methods are preferred; in the research group variable, studies were carried out with groups such as pre-service teachers, teachers, students, administrators, documents and academics; the effect of variable/demographic variable and the effect of teaching methods and techniques on 21st-century skills were highly emphasised. The study's results provided guiding recommendations to academics interested in studying 21st-century skills.

Keywords: 21st-century skills, graduate theses, thematic review

INTRODUCTION

Humanity, which has been able to adapt to every situation it has encountered from primitive times to the present day, has faced a new situation brought about by mechanization in the information age. While individual workforce and basic skills were previously important, with mechanization, mass workforce, and domain-specific skills have gained importance. In addition, machines or computers, necessitating the differentiation of the available workers and skills (Kalemkus, 2021), can now do many tasks that were previously performed by humans very quickly. For example, while an individual with basic mathematical skills and literacy skills could easily survive in the 1900s, higher-order thinking skills (creative thinking, metacognition, critical thinking, scientific literacy, entrepreneurship, communication, etc.) have become considered necessary for social integration and national development. In the 21st century, as technological developments are constantly changing, it is important to actively meet people's learning needs and motives (Medel-Añonuevo, Ohsako, & Mauch, 2001; Trilling & Fadel, 2009). For the dynamics of society to be directed in this direction, it is stated that individuals should have the mentioned high-level skills, that is, 21st-century skills (Trilling & Fadel, 2009). To identify the skills and to define the skills to be attributed to individuals as a result of needs, the “21st-century skills Joint Working Group” consisting of 32 members, including associations such as the National Education Association and the American Association of School Librarians, companies such as Microsoft, Lego, Apple, HP, Dell, etc., created the 21st-century skills learning framework (Department of Defence Education Activity, 2014). Based on this framework, P21 (2009) defined “learning and innovation skills”, “information, media, and technology skills” and “life and career skills”, and as three main themes and introduced 21st-century skills to the literature with the sub-skills of these main skills.

When the literature is scrutinized, although there are numerous classifications by institutions and organizations such as ATC21S (2007), EnGauge (2003), World Economic Forum (2016), and European Union (2007), the most accepted classification about 21st-century skills is the P21 (2009) classification. This classification is given below:

Table 1. P21 Framework for 21st-century skills

Learning and Innovation Skills	Information, Media, and Technology Skills	Life and Career Skills
<ul style="list-style-type: none"> • Critical Thinking and Problem Solving • Contact • Cooperation • Creativity and Innovation 	<ul style="list-style-type: none"> • Information Literacy • Media Literacy • Information and Communication Technologies (ICT) Literacy 	<ul style="list-style-type: none"> • Flexibility and Adaptation • Entrepreneurship and Self-Governance • Social and Intercultural Skills • Productivity and Accountability • Leadership • Responsibility

Since these skills serve as a guide for producing individuals with the attributes sought by society, education systems have begun to structure themselves around these skills. Researchers also make various evaluations and examinations in this direction. Among these researchers, Gurultu, Aslan, and Alci (2018) investigated the

competencies of primary and secondary school teachers in using 21st-century skills. Similarly, Incik-Yalcin (2020) conducted studies on teachers in the dimension of 21st-century skills and examined the relationship between lifelong learning tendencies of teachers. Bozkurt and Cakir (2016) investigated the 21st-century skills of secondary school students within the framework of various variables, while Gunuc, Odabasi, and Kuzu (2013) tried to define the 21st-century skills of student characteristics of pre-service teacher. Anagun, Atalay, Kilic, and Yasar (2016) conducted a scale development study to determine pre-service teachers' perceptions of competence regarding these skills. In the studies in the literature, publications were found in which the curricula of various courses were examined (Atli, 2019; Bal, 2018; Bektas, Sellum, & Polat, 2019; Deveci, Konus, & Aydziz, 2018). Eryilmaz and Uluyol (2015) evaluated the FATİH Project within the scope of 21st-century skills in their study. It is seen that the literature has diversified with similar studies.

As can be seen, the process of incorporating 21st-century skills into the framework of education systems has led researchers to research many topics. The studies examining the direction in which this research tend, their distribution according to years and subjects are carried out through thematic studies. Such studies aim to shed light on new research by presenting the research on the relevant topic holistically and in detail. It is possible to find many studies of this type in the literature (Altinpulluk, 2018; Aydeniz & Haydaroglu, 2021; Dogru, Guzeller, & Celik, 2019; Ekici, Abide, Canpolat, & Ozturk, 2017; Gul & Sozbilir, 2015; Karadag, 2009; Olofsson, Lindberg, Fransson, & Hauge, 2015; Rodríguez, Mula, Segovia, & Cruz-González, 2021; Zairul, 2020). In their study, Akcan, Dogan, and Ablak (2023) examined the articles on 21st-century skills published in the Web of Science database. Such a study, which may be important in terms of guiding the national literature, should also be conducted to examine graduate theses. It is seen that a similar study has not been conducted. The evaluation of master's and doctoral theses, which are one of the important publication sources of universities, within the framework of 21st-century skills is important for the structuring and development of the Turkish Education System. Because in this way, it will be possible to raise the educated individual profile that Turkey needs in line with the basic mission and vision of the Ministry of National Education. Concordantly, the purpose of this study is to carry out a thematic analysis of graduate theses published in Türkiye about 21st-century skills. Answers to the following questions were sought within this fundamental purpose:

- What is the distribution of graduate theses by year and type?
- What is the distribution of graduate theses by region?
- How is the distribution of graduate theses according to subject area?
- How is the distribution of graduate theses in terms of approach?
- How is the distribution of graduate theses according to method and model preference?
- How is the distribution of graduate theses according to research group/sample/participant group?
- How is the distribution of graduate theses according to the subject they emphasize in their results?

METHOD

The method consists of four sub-headings: research design, data collection process, data analysis, validity and reliability. Each sub-heading is discussed in detail.

Research Design

The research was conducted with the document analysis method by adopting a qualitative approach. The document analysis model involves the processes of compiling and analysing existing records and documents and researching, examining, and evaluating documents for a specific purpose (Bowen, 2009). Within the scope of the research, the aim of conducting a thematic analysis of the graduate theses published in Turkey about 21st-century skills and conducting this thematic analysis under seven themes, year and type variable, region variable, subject area variable, preferred approach type variable, method and model variable, research group/sample/participant group variable and emphasised result variable, paved the way for the document analysis method to be used.

Data Collection Process

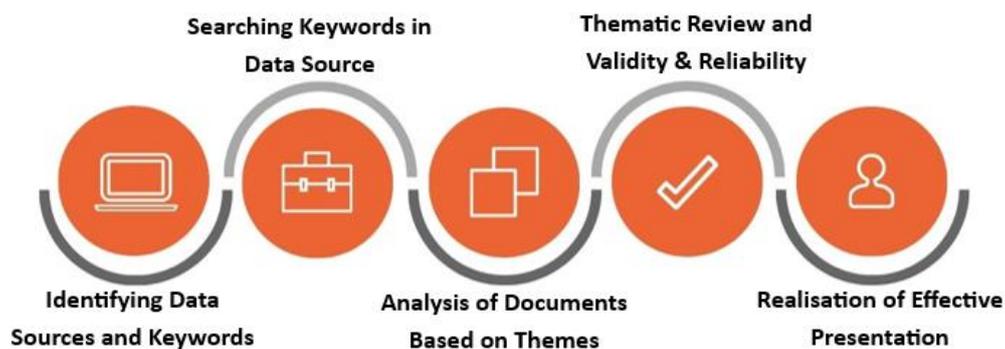


Figure 1. Data Collection Process

As can be seen in Figure 1, the data collection process was carried out in 5 steps: (i) identifying data source and keywords, (ii) searching keywords in the data source, (iii) analysis of documents based on themes, (iv) thematic review and validity & reliability, and (v) realization of an effective presentation. In the first step of the data collection process, answers were sought to the questions "Which data source will be used in the research process?" and "Which keywords will limit the research?". The National Thesis Centre was used as the data source depending on the fact that graduate theses are published by the National Thesis Centre in Turkey. The concepts of "21st-century skills", "21st-century skill" and "twenty-first-century skills" were determined as keywords. In the second step, the research was conducted on the data source determined in the first step depending on the keyword and a total of 133 graduate theses were reached. In the third step, the 133 graduate theses obtained were examined depending on the themes as the year and type variable, the region variable, the subject variable, the preferred approach type variable, the method and model variable, the research group/sample/participant group variable, and the emphasised result variable. In the fourth step, it was ensured that the thematic analysis process was carried out by examining the theses depending on the themes, and studies on the validity and

reliability process were carried out during the analysis process. The studies carried out are explained in detail under the title of validity and reliability. In the fifth and last step, to present the data for each theme more effectively, it was decided how to present them in tables and graphs and the findings were formed.

Data Analysis

Considering the purpose of the research, the studies were analysed comprehensively by the thematic analysis method. The thematic analysis aims to obtain data by providing the opportunity to compare the similarities and differences of the studies because of considering the qualitative approach principles of the studies within the scope of a specific subject (Patton, 2002). At the same time, thematic analysis allows the texts to be presented as themes and codes by enabling the examination and synthesis of research (Au, 2007).

Within the scope of the research, the analysis of the graduate theses published in Turkey about 21st-century skills was provided by the analysis matrix. There were seven themes in the analysis matrix: year and type variable of the theses, region variable, subject variable, preferred approach type variable, method and model variable, research group/sample/ participant group variable, and emphasised result variable.

Validity and Reliability

As the first step in the validity and reliability dimension, careful analyses were carried out to avoid data loss. Within the scope of the validity factor, internal and external validity dimensions were taken into consideration. In line with the internal validity dimension, the member control process was carried out. The member control process is a set of procedures that enables the determination of whether the obtained research has been transformed into codes and themes accurately, correctly, and systematically, and whether there are missing or repetitive research (Cohen, Manion, & Morrison, 2000).

When the external validity dimension is considered, attention was paid to the creation of original and innovative categories in the analysis of the data. The reliability factor of the research was calculated using Miles and Huberman's (1994) formula;

$$\text{Reliability} = \frac{\text{Agreement}}{\text{Agreement} + \text{Disagreement}} \times 100$$

As a result of the calculation process, the percentage of agreement was calculated as 84%. Following the determination of the inter-coder reliability value at sufficient levels (Miles & Huberman, 1991), the analysis process of the research was continued. In addition, the coding and theme creation process was presented to an expert in content analysis, and validity and reliability control was ensured.

FINDINGS

Under the title of findings of the research, the presentation of the graduate theses published in Turkey about "21st-century skills" is carried out as items depending on the year and type variable of the theses, region variable,

subject variable, preferred approach type variable, method and model variable, research group/sample/ participant group variable and emphasised result variable.

Distribution of Graduate Theses by Year and Type

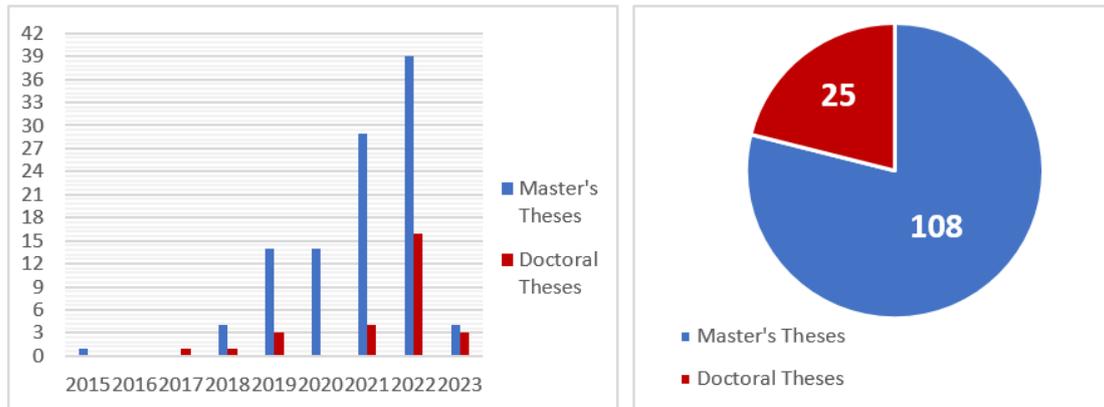


Figure 2. Distribution of Theses by Year and Type

When examining Figure 2, it is seen that a total of 133 theses were published about "21st-century skills" at the graduate level in Turkey and 108 of these theses were at the master's level and 25 of them were at the doctoral level. In the year-based analysis, it is seen that 1 thesis was published at the master's level in 2015; 1 thesis at the doctoral level in 2017; 4 theses at the master's level, and 1 thesis at the doctoral level in 2018; 14 theses at the master's level and 3 theses at the doctoral level in 2019; 14 theses at the master's level in 2020; 29 theses at the master's level and 4 theses at the doctoral level in 2021; 39 theses at the master's level and 16 theses at the doctoral level in 2022; and 4 theses at the master's level and 3 theses at the doctoral level in 2023. Based on the data obtained, it is possible to say that there are more master's theses than doctoral theses in the field of "21st-century skills" at the graduate level in Turkey.

Distribution of Graduate Theses by Region



Figure 3. Distribution of Theses by Region

As stated in Figure 3, the distribution of the theses conducted at the graduate level in Turkey in the subject area of "21st-century skills" according to seven different regions is seen. When the distribution of theses according to regions is examined, it is seen that 18 theses were conducted in 9 different universities in the Black Sea Region; 36 theses were conducted in 15 different universities in the Marmara Region; 15 theses were conducted in 15 different universities in the Aegean Region; 38 theses were conducted in 15 different universities in the Central Anatolia Region; 8 theses were conducted in 4 different universities in the Eastern Anatolia Region; 4 theses were conducted in 3 different universities in the Southeastern Anatolia Region; and 15 theses were conducted in 7 different universities in the Mediterranean Region. Based on the data obtained, it is possible to say that although it is seen that the theses carried out at the graduate level in the subject area of "21st-century skills" in Turkey are concentrated in Central Anatolia and Marmara Regions, it is possible to say that master's theses are carried out in seven different regions.

Distribution of Graduate Theses According to Subject

Table 2. Distribution of Theses by Subject Area

Subject	Frequency	%
Relationship between Variable/ Demographic Variable and 21st Century Skill	57	37,50
Relationship between Teaching Methods and Techniques and 21st-century skills	37	24,34
Relationship between Curricula and 21st-century skills	16	10,53
Relationship between Science and 21st-century skills	13	8,55
Relationship between Teaching Environments and 21st-century skills	9	5,92
Relationship between Textbooks and 21st-century skills	5	3,29
Relationship between Attitude Towards STEM and 21st-century skills	5	3,29
Relationship between Measurement Tool Development and 21st-century skills	3	1,97
Relationship between Turkish/Turkish Language and Literature and 21st-century skills	2	1,32
Relationship between Preparation for Baccalaureate Programme and 21st-century skills	2	1,32
Relationship between Sociology / Philosophy of Education and 21st-century skills	2	1,32
Relationship between Metaphorical Perception and 21st-century skills	1	0,66
TOTAL	152	%100

As outlined in Table 2, it is seen the subjects are emphasized under 11 different topics: relationship between variable/ demographic variable and 21st century skill (n=57), relationship between teaching methods and techniques and 21st-century skills (n=37), relationship between curricula and 21st-century skills (n=16), relationship between science and 21st-century skills (n=13), relationship between teaching environments and 21st-century skills (n=9), relationship between textbooks and 21st-century skills (n=5), relationship between attitude towards stem and 21st-century skills (n=5), relationship between measurement tool development and 21st-century skills (n=3), relationship between Turkish/Turkish language and literature and 21st-century skills (n=2), relationship between preparation for baccalaureate programme and 21st-century skills (n=2), relationship between sociology / philosophy of education and 21st-century skills (n=2) and relationship between metaphorical perception and 21st-century skills (n=1). When the subject of the theses is evaluated, it is remarkable that the total rate of theses conducted on the topics of the relationship between variable/ demographic variable and 21st century skill, the relationship between teaching methods and techniques and

21st-century skills, the relationship between curricula and 21st-century skills, and the relationship between science and 21st-century skills. On the other hand, although 133 theses were carried out in the research area, the fact that more than one topic was handled within the scope of some theses affects reaching the number 152 in the data obtained for the subject.

Distribution of Graduate Theses in Terms of Approach

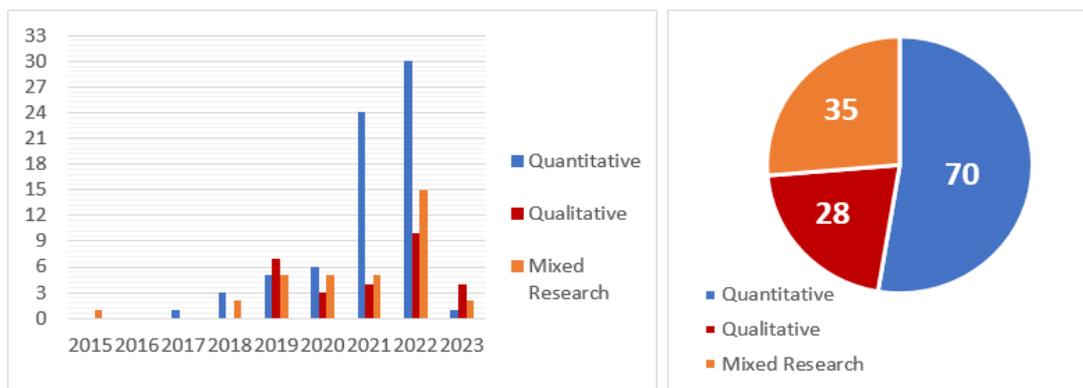


Figure 4. Distribution of Theses in Terms of Approach

As illustrated in Figure 4, it is seen that the theses conducted at the graduate level in Turkey on the subject of "21st-century skills" are categorized according to three approach types: quantitative approach (n=70), qualitative approach (n=28), and mixed research approach (n=35). Because 52.63% of the theses were conducted based on a quantitative research approach, it is possible to say that quantitative research approaches are preferred in half of the theses conducted at the graduate level in Turkey on the subject of "21st-century skills". While research approaches that use a combination of quantitative and qualitative research approaches are in second place among the preferred research approaches, studies in which the qualitative research approach is preferred are proportionally in last place. It is also noteworthy that the number of theses conducted based on a qualitative research approach corresponds to less than half of the number of theses conducted based on a quantitative research approach.

Distribution of Graduate Theses according to Method and Model Preference

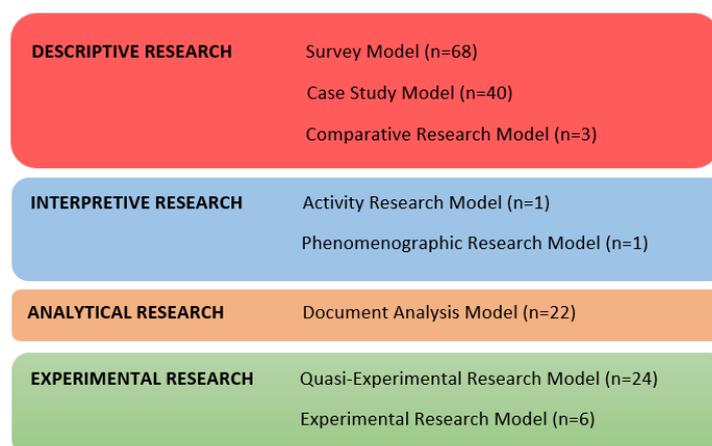


Figure 5. Distribution of Theses According to Method and Model Preference

As Figure 5 demonstrates, it is seen that the theses conducted at the graduate level in Turkey in the subject area of "21st-century skills" are grouped under four categories: descriptive research methods, interpretive research methods, analytical research methods, and experimental research methods. Within the scope of theses conducted at the graduate level, 111 studies in which descriptive research methods were preferred ($n_{\text{survey model}}=68$, $n_{\text{case study model}}=40$, $n_{\text{comparative research model}}=3$), 2 studies in which interpretive research methods were preferred ($n_{\text{activity research model}}=1$, $n_{\text{phenomenographic research model}}=1$), 22 studies in which analytical research methods were preferred ($n_{\text{document analysis model}}=22$) and 30 studies in which experimental research methods were preferred ($n_{\text{quasi-experimental research model}}=24$, $n_{\text{experimental research model}}=22$). 21st-century skills" in Turkey, it is possible to say that the survey model, case study model, quasi-experimental research model, and document analysis model are more preferred models compared to other models. On the other hand, although 133 theses were conducted in the research, the fact that more than one method/model was discussed in the theses in which mixed research approaches were preferred affected reaching the number 165 in the data obtained in the method/model preference.

Distribution of Graduate Theses according to Research Group/Sample/Participant Group

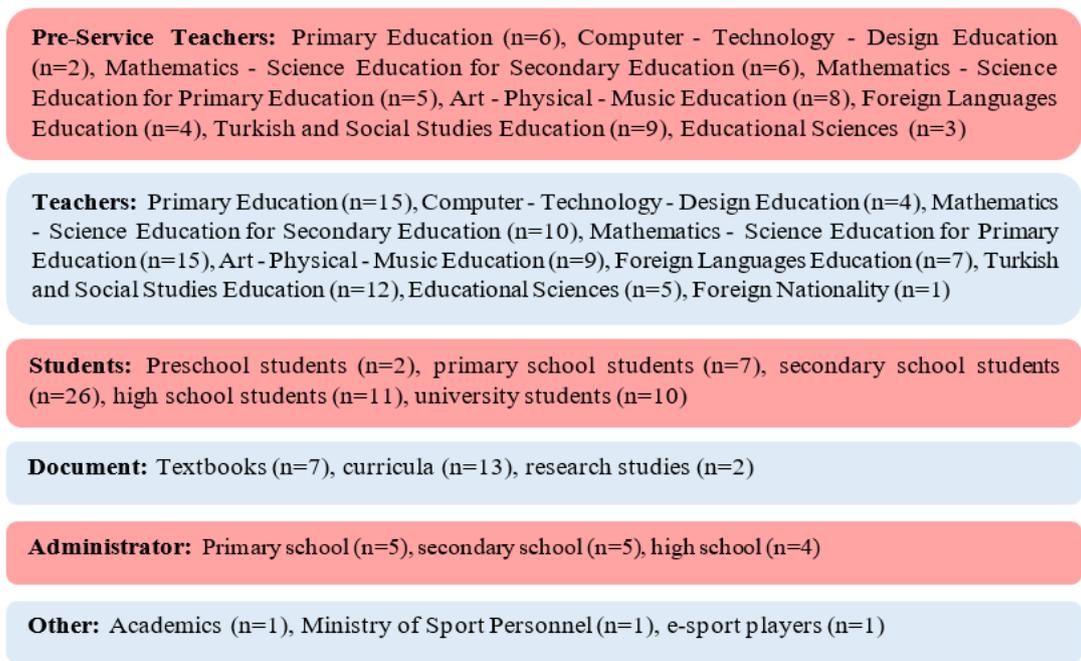


Figure 6. Distribution of Theses According to Research Group/Sample/Participant Group

When Figure 6 is examined, it is seen that the groups that are handled as research group/sample/participants in the theses conducted at the graduate level in Turkey on the subject of "21st-century skills" are grouped under six headings: pre-service teachers, teachers, students, documents, administrators, and others. It is seen that there are proportionally close values in the choices made among the groups specified as pre-service teachers, teachers, administrators, and others, middle school students are preferred more frequently than students at other levels in the choice among students, and textbooks and curricula come to the fore in the choice among documents.

Distribution of Graduate Theses According to the Subject They Emphasize in Their Results

Table 3. Distribution of Theses According to the Subject Emphasized in the Results

The Subject Emphasized in the Results	Frequency	%
The Effect of Variable/ Demographic Variable on 21st Century Skill	66	32,35
The Effect of Teaching Methods and Techniques on 21st-century skills	50	24,51
The Effect of Educational Technology Use on 21st-century skills	20	9,80
Including 21st-century skills in Curricula	18	8,82
The Effect of Sciences on 21st-century skills	16	7,84
The Effect of Teaching Environments on 21st-century skills	12	5,88
Including 21st-century skills in Textbooks	10	4,90
The Effect of Attitude Towards STEM on 21st-century skills	6	2,94
Valid and Reliable Measurement Tool for 21st-century skills	3	1,47
The Effect of Material Development Studies on 21st-century skills	2	0,98
The Effect of Social and Emotional Skills on 21st-century skills	1	0,49
TOTAL	204	%100

As Table 3 illustrates, it is seen that the results are emphasized under 11 different topics: the effect of variable/demographic variables on 21st-century skills (n=66), the effect of teaching methods and techniques on 21st-century skills (n=50), the effect of educational technology use on 21st-century skills (n=20), including 21st-century skills in curricula (n=18), the effect of sciences on 21st-century skills (n=16), the effect of teaching environment on 21st-century skills (n=12), including 21st-century skills in textbooks (n=10), the effect of attitude towards 21st-century skills (n=6), a valid and reliable measurement tool for 21st-century skills (n=3), the effect of material development studies on 21st-century skills (n=2), and the effect of social and emotional skills on 21st-century skills (n=1). When the subject they emphasize in the results of the theses are evaluated, it is remarkable that the total rate of theses that emphasize the effects of variable/demographic variables on 21st-century skills and the effects of teaching methods and techniques on 21st-century skills is approximately 56.86%. On the other hand, although 133 theses were carried out in the research area, the fact that more than one result was emphasized within the scope of the theses influences reaching the number 204 in the data obtained for the subject.

CONCLUSION and DISCUSSION

The purpose of this study is to carry out a thematic analysis of graduate theses published in Türkiye about 21st-century skills. Depending on the thematic analysis process, a holistic perspective on 21st-century skills will be provided and it will guide researchers who want to research the subject. According to the fact that the graduate theses are published by the National Thesis Centre in Türkiye, 133 graduate theses were reached. As a result of the analysis, it is seen that most of the graduate theses between 2019-2020-2021 and 2022 focused on 21st-century skills. It is thought that this situation may be because 21st-century skills are up to date in these years. Trilling and Fadel (2009) stated that the reason why studies in the field of education have focused on 21st-century skills in recent years may be due to the transformation from the understanding of providing students with only academic knowledge to gaining more comprehensive and applicable skills. When the studies on 21st-century

skills in recent years were examined, it was concluded that 108 of them were at master's and 25 of them were at doctoral level. The reason why the theses on 21st-century skills in recent years are at the master's level may be that these skills are a field that covers a wide range of subject areas and includes many sub-skills, and thesis studies on these skills require comprehensive and detailed examination.

It was concluded that the postgraduate theses on 21st-century skills in Turkey were distributed in 7 different regions. However, when the theses were examined in detail, it was seen that there were mostly graduate theses on 21st-century skills in Marmara and Central Anatolia Regions. This may be because Marmara and Central Anatolia Regions are one of the most populous and developed regions of Turkey and host many universities, master's, and doctoral programs. Therefore, educational institutions in these regions can offer students opportunities to conduct research and prepare theses in a wide range of disciplines. Again, the fact that the Marmara Region is a region where digital transformation and technology-oriented jobs are intense may increase the tendency of employers and educational institutions in this area to focus on 21st-century skills. In conclusion, the fact that the Marmara and Central Anatolia Regions are the most densely populated and economically developed regions of Turkey, the diversity of educational institutions, and the needs of the business world can be counted among the reasons why these on 21st-century skills are common in these regions. These factors may increase the importance and diversity of research conducted in these regions.

When the distribution of the postgraduate theses on 21st-century skills according to subject areas was examined, it was concluded that the most studied subjects were the variables, teaching methods and techniques, curricula, science, teaching environments, textbooks, attitudes towards STEM, measurement tool development, Turkish/Turkish Language Literature course, preparation for the Baccalaureate program, sociology/philosophy of education, and studies focusing on the relationship between metaphorical perception and 21st-century skills. It is noteworthy that one of the most studied topics is teaching methods, techniques, and 21st-century skills. Stigler and Hiebert (2009) emphasized that the relationship between 21st-century skills and teaching methods and techniques in education is important. The reason for this importance is the use of appropriate teaching methods to effectively develop 21st-century skills and prepare students for the demands of the future. In addition, Stigler and Hiebert (2009) stated the reasons for the importance of the relationship between 21st-century skills and teaching methods and techniques in education as effective learning, active participation, cooperation and teamwork, technology integration, and continuous learning. In the study, it was concluded that one of the most studied subjects in the distribution according to subject areas was the relationship between science and 21st-century skills. When the literature is examined, it is seen that the intertwining of 21st-century skills and science is effective in directing studies on this subject (Agaoglu & Demir, 2020; Bybee, 2013; Hacıoglu, 2021; Voogt, Knezek, Christensen, & Lai, 2018). Voogt, Knezek, Christensen, and Lai (2018), one of these researchers, examined how 21st-century skills can be integrated into science education and how students can develop these skills and emphasized the importance of emphasizing skills such as critical thinking, communication, and creativity in science teaching. The fact that 21st-century skills include critical thinking, communication, and creativity has led researchers to focus on the relationship between science and 21st-century skills.

When the distribution of the postgraduate theses on 21st-century skills in terms of approach is examined, it is seen that quantitative and qualitative studies are included the most and the least. There may be several reasons for this situation. One of them is that abstract concepts such as 21st-century skills can be difficult to measure, but quantitative studies make these skills measurable in a numerical format. In this way, measurements such as student achievements, skill levels, and progress can be obtained. Another reason is that when quantitative studies are conducted on large sample groups, it means that the results can be representative of a large population. This can be considered as making the results more generalizable. As a result, quantitative studies contribute to the objective assessment of 21st-century skills in education and data-based decision-making. However, qualitative studies are also important because qualitative methods provide an in-depth understanding of student experiences and attitudes. Therefore, the combination of quantitative and qualitative studies may offer a better approach to understanding and addressing 21st-century skills in education more comprehensively. In this study, when the postgraduate theses were examined, it was concluded that the most used method among the studies on 21st-century skills was mixed studies.

When the distribution of postgraduate theses on 21st-century skills according to method and model preferences is examined, it is seen that the most preferred methods are relational survey, case study, quasi-experimental research model, document analysis, simple experimental research model, comparative research model, action research model, and phenomenographic research model, respectively. The observation that survey research model and experimental methods are mostly used in measuring individuals' 21st-century skills means that there are studies aimed at practicing these skills. Similarly, Chen and Yang (2019) stated that the factors affecting 21st-century skills were mostly determined through experimental studies in their study in which the data obtained from different studies were brought together using the meta-analysis method. Similarly, Yilmaz (2021) shows that the gradual integration of technology into the education process provides a positive change in pre-service teachers' critical and creative thinking, multidimensional 21st-century skills, and academic achievement. Jones et al. (2020) conducted technology-supported learning on randomly selected experimental and control groups. In conclusion, experimental studies help to scientifically and empirically examine the effects of different teaching methods to develop 21st-century skills in education. Their results help educators and practitioners to identify and implement the most effective strategies that support 21st-century skills. However, it is important to keep in mind that in addition to experimental studies, other research methods can also provide important information in this field. In addition, when the distribution of postgraduate theses on 21st-century skills according to the research group was examined in this study, it was concluded that the studies were conducted with pre-service teachers, teachers, students, and administrators.

RECOMMENDATIONS

. Some recommendations were made based on the results obtained from the study.

- Regarding the fact that the theses carried out on 21st-century skills at the master's level are more than the theses carried out at the doctoral level, it can be suggested to carry out original and effective studies at the doctoral level.
- The use of 21st-century skills is one of the main objectives of curricula. Therefore, the studies conducted in the field of teaching are aimed at the application of 21st-century skills in learning environments.
- Since the measurement of 21st-century skills will be a long-term process, it can be suggested that future doctoral theses should be directed to this field.
- The fact that there were no findings on the measurement and evaluation of 21st-century skills in the theses analysed, it can be suggested that future theses should be directed to this field.

ETHICAL TEXT

"In this article, the journal writing rules, publication principles, research and publication ethics, and journal ethical rules were followed. The responsibility belongs to the authors for any violations that may arise regarding the article. Since the theses on 21st-century skills were analyzed by document analysis method, ethics committee permission was not required."

Author(s) Contribution Rate: All authors were involved in concept, design, collection of data, interpretation, writing, and critically revising the article. Therefore, the contribution rate of the authors is first author 50% and second author 50%.

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