A SYSTEMATIC REVIEW STUDY ON EDUCATIONAL TECHNOLOGY AND DISTANCE EDUCATION: THE CASE OF TURKEY

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ABSTRACT

In this study, the purpose was to reveal the content analysis of master's theses and doctoral dissertations in the field of CEIT between 2018-2020. The field of CEIT could be said to cover the fields of educational technology and distance education. A total of 156 master's theses and dissertations were examined in order to identify the keywords, academic discipline, research areas, theoretical frameworks, research designs and models, variables and related institutions. According to the research findings, it was seen that quantitative methods were mostly used in the theses and dissertations examined and that mixed methods were used in master's theses more than in doctoral dissertations. In addition, it was revealed that few of the theses and dissertations had theoretical foundations. K-12 students were mostly preferred as the type of participant, and scales and interviews were most popular as data collection tools. Moreover, the variables of academic performance and effectiveness were mostly used as dependent variables. The present study, which conducted systematic content analysis of master's and doctoral dissertations in the field of CEIT, is thought to be important in terms of revealing the current situation in the fields of Educational Technology and Distance Education and determining the research trends.

INTRODUCTION

Especially in the past few years, the changes in technology have put it in the center of all forms of teaching, yet in fact, the role of technology in education is claimed to date back to 500 B.C (Saettler, 1990). Although it has such a long history, it could be stated that the concept of Educational Technology (ET) has shown a rapid change especially depending on the development of computers. With the implementation of these rapid changes in the field of education, the concept of ET has started to become popular. There are many studies indicating that the concept of Instructional Technologies (IT) is used in similar meanings along with the concept of ET (Azimi & Fazelian, 2013; Gedik, 2017; Lakhana, 2014). In 2007, Association for Educational Communications and Technology (AECT) described the label of Educational Technology (ET) as follows: ET refers to the study and ethical implementation of facilitating learning and improving performance by developing, using, and administrating suitable technological processes and resources (Richey et al.,2008).

The concept of ET in Turkey could be said to have occurred in higher education with the establishment of the department of Computer Education and Instructional Technology (CEIT) and with the admission of its first undergraduate students (Durak et al., 2018). Although it seems it was separate from distance education (DE) in the past, it could be stated that today, the field of educational technology has become an area integrated with distance education. Early Multimedia educational software used in the past has now been replaced by educational software running on the Internet. This situation has begun to completely change the field of CEIT and has especially reflected in the postgraduate publications of the field. As it is known, the post-graduate level includes master's and doctorate degrees. Master's degree education can be regarded as education which allows undergraduate students to advance their education level by developing themselves and gaining experience. Doctorate education, on the other hand, includes studies which are more professional and more in-depth, and which contribute more to the relevant field. Therefore, it could be stated that in order to evaluate the postgraduate studies in the related field as a whole, it is necessary to focus on master's and doctoral studies together.

Considering the field of CEIT as a whole, its being large with a wide variety of studies make it difficult to follow current trends and to trace where the field has come from historically. Therefore, studies that reveal the historical development of educational technologies and distance education and the current trends in these areas are of great importance, and these studies provide teachers, administrators and researchers insights into these issues (Durak et al., 2018). The purpose of this study was to conduct systematic review of master's theses and doctoral dissertations carried out in the fields of CEIT in the last three years in Turkey. For this reason, the focus was more on helping people interested in educational technology and distance education in Turkey as well as on having these people more prepared for the probable difficulties in their future studies. In this respect, the relevant studies were analyzed in terms of various variables and compared with the findings of other studies in the literature; finally, the trends in the related topics were determined. In the study, the reasons for choosing the last 3 years were as follows: It was an important factor that Durak et al., in their study in 2018, examined the doctoral dissertations conducted in the same field until 2016. In addition, when the content analyzes conducted in the field in the literature were examined, it was seen that these studies generally covered the year 2018 and before; that mostly master's theses were examined; and that the studies examining master's and doctoral dissertations together were limited in number. Considering the fact that the up-to-dateness of studies conducted in a field like CEIT is extremely important, it could be stated that it would be valuable to conduct a content analysis on up-to-date studies conducted in the last three years.

Figure 1 presents a graph related to the studies conducted in the fields of ET and DE in the WOS database in the last 10 years.
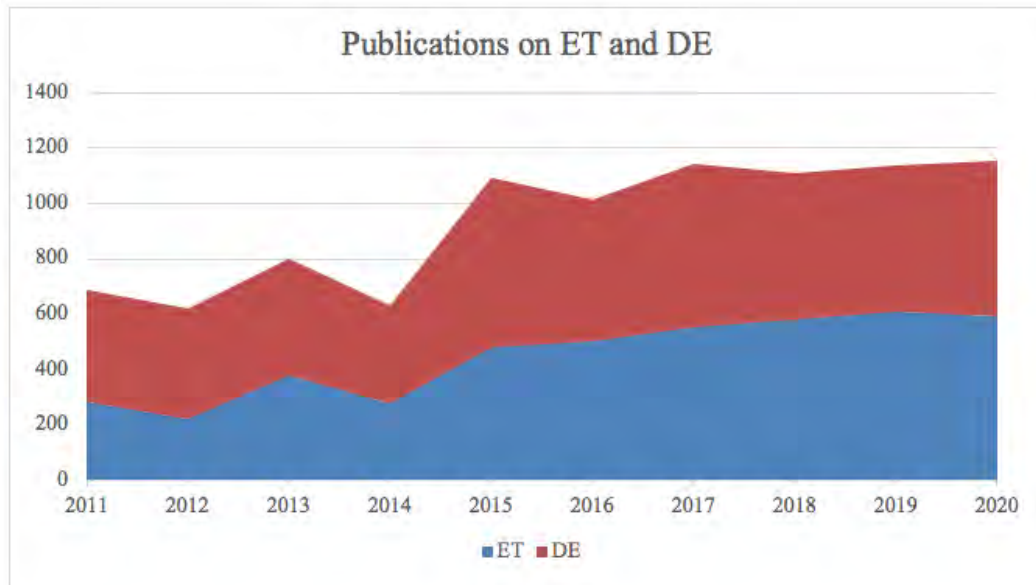
Figure 1. Number of Papers (ET & DE) in Web of Science Database

According to Figure 1, there has been an increase in the number of scientific studies on ET and DE over the years. This situation could be said to indicate that ET and DE are getting increasingly important and that they will be an inevitable part of education. The fact that CEIT is the only discipline hosting these two areas in Turkey could be said to increase the importance of analyzing the studies in this discipline. In this study, a total of 131 master's theses and 31 doctoral dissertations were examined in order to determine keywords, academic discipline, research areas, theoretical frameworks, research designs and models, variables and related institutions. In this respect, it is thought that the study examining master's and doctoral dissertations is important in terms of revealing the current situation in the field of CEIT and determining the research trends.

Within the main objective of the study the following research questions were considered:

What are the most frequent/ly

- Generated keywords,
- Chosen academic discipline,
- Chosen research areas,
- Emphasized theoretical frameworks,
- Chosen research designs and models,
- Used data collection tools,
- Targeted participant groups,
- Focused variables,
- Related institutions

in the field of CEIT between 2018-2020.

REVIEW OF LITERATURE

As a result of the literature review conducted within the scope of this study, many content analysis studies on Educational Technology, Distance Learning and other concepts considered to belong to these fields were found. Table 1 summarizes the distribution of the studies between 2009 and 2020 according to the outstanding findings, years, number of studies and research topics.

Table 1. Studies in the literature by authors / highlights / years/ number of studies & types and topics

Author(s)	Highlights of the Research Findings	Years	Number of papers / Types *	Research Topics
(Alper & Gulbahar, 2009)	Method: Quantitative Data collection tool: Questionnaire	2003-2007	187 A	Educational Technologies
	Dependent variables: Master			
(Simsek et al., 2008)	Method: Qualitative Data collection tool: Achievement Test	1996-2006	64 MT	Educational Technologies
(Erdogmus & Cagiltay, 2009)	Model: Experimental design Participant type: K12 Student	……-2008	248 MT + D	Educational Technologies
(Kurt et al., 2009)	Method: Quantitative Participant type: Undergraduate Student	2002-2008	106 MT + D	Instructional Technologies
(Bozkaya et al., 2012)	Method: Quantitative Data collection tool: Questionnaire	2008-2011	273 A	Educational Technologies
	Participant type: Undergraduate Student			
(Goktas et al., 2012)	Participant type: Undergraduate Student	2000-2009	32 A	Educational Technologies
(Celik, 2016)	Method: Quantitative Data collection tool: Questionnaire	2003-2015	100 D	Innovation
(Kilic-Cakmak et al., 2016)	Method: Qualitative Data collection tool: Questionnaire	2014		Educational Technologies
	Participant type: Undergraduate Student			
(Durak ve digerleri, 2017)	Method: Quantitative Data collection tool: Questionnaire	1986-2015	285 MT	Distance Learning
	Participant type: Undergraduate Student			
(Ozerbas & Egin, 2017)	Method: Qualitative Data collection tool: Questionnaire/Scale	2010-2015	361 A	Educational Technologies
	Participant type: K12- Teacher			
(Akbaba et al., 2018)	Method: Quantitative Data collection tool: Questionnaire	2010-2013	142 MT + D + A	Information Technologies
	Participant type: Undergraduate Student			
(Durak & Cankaya, 2018)	Method: Quantitative Data collection tool: Interview	2009-2018	58 A	Seamless Learning
	Participant type: K12 Student			
(Durak et al., 2018)	Method: Mixed Dependent variables: Attitude/Achievement	2005-2015	222 D	Educational Technologies
	Data collection tool: Questionnaire/Scale/Interview			
(Kunduracioglu & Durak, 2018)	Method: Quantitative Data collection tool: Focus Group	2011-2017	34 MT	Gamification in education
	Participant type: Undergraduate Student			
(Oztop & Ozerbas, 2018)	Method: Quantitative Model: Document Analysis	2005-2018	51 MT	Digital Subject Supported Education
	Data collection tool: Achievement Test			
	Participant type: K12 Student			
(Sari & Taser, 2018)	Method: Mixed Model: Survey Data collection tool: Scale	2004-2017	16 MT + D	Digital Citizenship
	Participant type: K12 Student			
(Altinpulluk, 2018)	Method: Mixed Data collection tool: Achievement Test	2007-2016	40 MT + D	Augmented Reality
	Participant type: Undergraduate Student			
(Dasdemir et al., 2018)	Method: Quantitative Data collection tool: Achievement Test	2012-2017	51 MT + A	STEM
	Participant type: K12 Student			
(Bozkurt et al., 2019)	Method: Qualitative	2014-2016	738 A	STEM
(Ozen & Baran, 2019)	Method: Qualitative	2016-2018	4335 MT + D	Distance Learning

(Sunger, 2019)	Model: Design Based Data collection tool: Interview Participant type: K12 Student	2009-2018	54 MT + D	Augmented Reality
(Tosuntas et al., 2019)	Method: Quantitative Model: Survey Data collection tool: Scale	2013-2018	148 MT	Education and Instructional Technologies
(Uygun & Sonmez, 2019)	Method: Quantitative Data collection tool: Achievement Test Participant type: Undergraduate Student	2010-2017	31 MT + D + A	Mobile Learning
(Aydin et al., 2019)	Method: Quantitative Model: Survey Participant type: K12 Student	2002-2018	81 MT	Distance Learning
(Durak & Cankaya, 2020)	Method: Qualitative Data collection tool: Questionnaire Participant type: Undergraduate Student	2010-2019	180 A	Distance Learning
(Tongel et al., 2020)	Method: Quantitative Model: Survey Participant type: Undergraduate Student	2013-2018	206 MT + D	Media and Student
(Yildiz et al., 2020)	Method: Quantitative Model: Survey Participant type: Undergraduate Student	2015-2020	15	Educational Technologies
(Konan, 2020)	Method: Quantitative Data collection tool: Questionnaire/Scale	2009-2019	94 A	Programming Teaching

When Table 1 was examined, it was seen that in more than half of the 28 review studies submitted, quantitative methods took the first place. This was followed by qualitative and mixed methods. When evaluated in terms of the data tools, it was seen that questionnaire, scale and achievement tests were mostly used in the review studies. When the studies were examined with respect to the samples' levels, it was found that undergraduate students ranked first in about half of the studies, which was followed by K12 and master's students.

METHOD

This study, which was conducted to determine the trends in master's theses and dissertations published in the field of CEIT (ET + DE) in Turkey between 2018-2020, was carried out with the systematic content analysis method. The database of Turkish Council of Higher Education (TCHE) was used to reach the master's theses and dissertations. TCHE has an electronic database including all the M.A. theses and dissertations conducted in Turkey till the time of the study, and the database is accessible to all researchers. For the theses and dissertations examined within the scope of the study, a search was done within the framework of the following criteria.
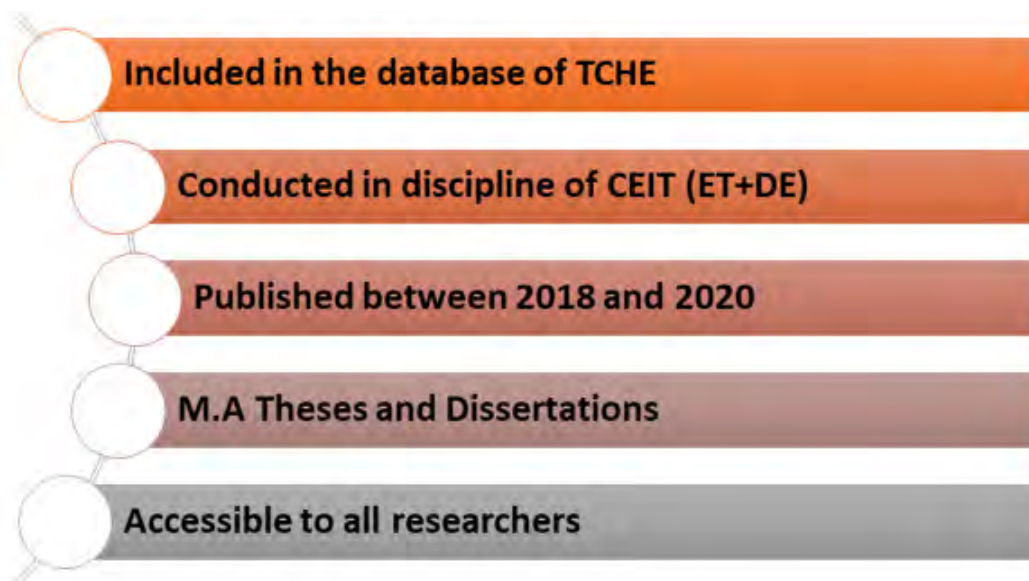

Included in the database of TCHE

Conducted in discipline of CEIT (ET+DE)

Published between 2018 and 2020

M.A Theses and Dissertations

Accessible to all researchers

Figure 2. Search Criteria used in the study

After the search criteria of the study were determined, the filtering options in Figure 3 were used to reach the studies in TCHE database on which content analysis would be conducted, and the master's theses and doctoral dissertations to be examined in the study were reached. W
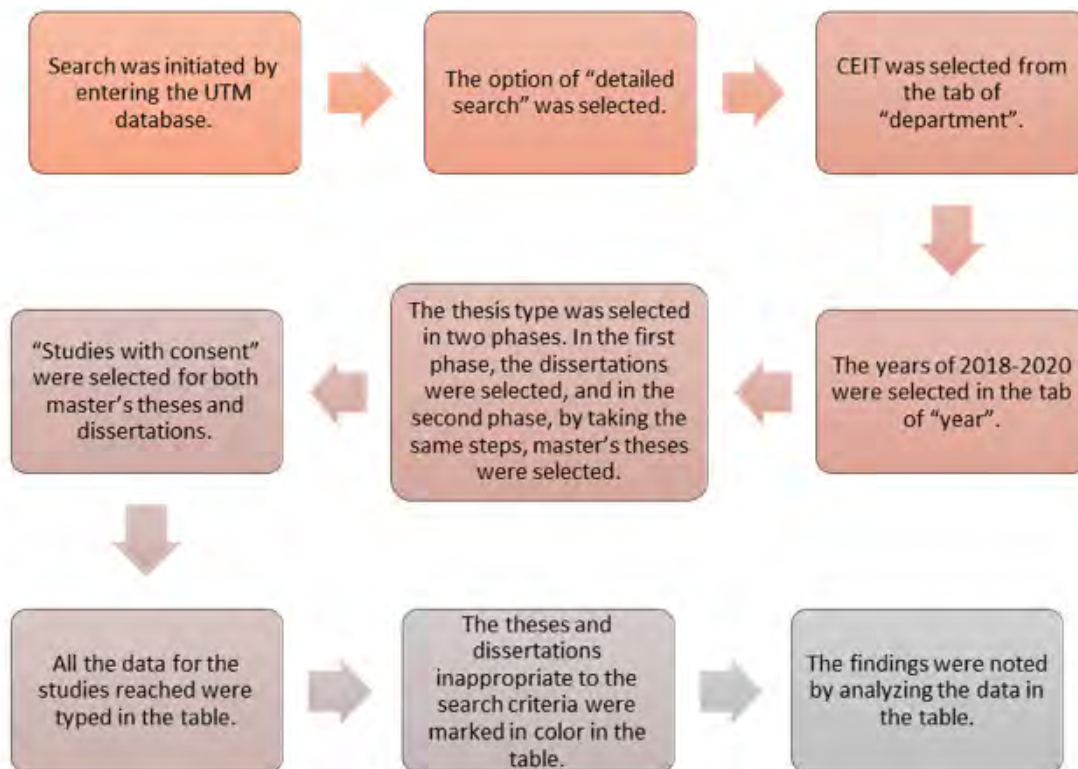

Figure 3. The Overall Process of Systematic Content Analysis

As a result of the search, 131 master's theses and 31 dissertations were reached. For various reasons, six theses were excluded from the study. Of all the 156 theses and dissertations obtained, 11 were written in English while 145 were written in Turkish. The related theses and dissertations were examined in terms of keywords, academic discipline, research areas, theoretical frameworks, research designs and models, variables, relevant institutions and data analysis methods. Descriptive statistics for the variables were examined with percentage and frequency values. These statistics were then interpreted in comparison with the results of similar studies in the literature.

Reliability

The master's theses and doctoral dissertations reached as a result of the search were put in a table according to the determined criteria in online environment. Each researcher analyzed the theses and dissertations separately and transferred their results to the table. Later, the data in the table prepared by the researchers were compared to identify the differences, and the related theses and dissertations were examined again. As a result, the inter-rater reliability of the coding was K =.890. According to Altman (1991), the extent of agreement for Cohen's kappa can be qualified as very good (0.81 to 1.00). Therefore, the reliability of raters can be considered to be very good. Content analysis was completed arriving at a consensus on all the findings.

FINDINGS AND DISCUSSION

This section presents the findings regarding keywords, academic discipline, research areas, theoretical frameworks, research designs and models, variables and the ordering of relevant institutions. At the same time, comparisons of the findings with those of other studies in the literature was interpreted.

Keywords

The keywords used in a total of 156 theses and dissertations examined within the scope of the research were analyzed. It was seen that 347 different keywords were used in the theses and dissertations examined. The most frequent keywords are given in Figure 4.

Figure 4. Most frequent keywords

When Figure 4 was examined, it was seen that the most frequently used word in master's theses and doctoral dissertations was Achievement. Achievement, Attitude, Online Learning, Computational Thinking and Programming were the top five keywords among the most used keywords. The fact that these keywords were among the frequently used keywords in the field of CEIT (ET + DE) could not be said to be surprising.

Academic Discipline

It was seen that the master's theses and doctoral dissertations within the scope of the study took place in four different disciplines. Table 2 presents the related disciplines.

Table 2. Distribution by Academic Disciplines

Discipline*	f	%
Education and Training	146	%93,59
Science and Technology	8	%5,13
Computer Science and Control	1	%0,64
Information and Document Management	1	%0,64

* The names of the academic disciplines belong to TCHE

According to Table 2, most of the studies were conducted in the field of "Education and Training". This finding was not surprising due to the content analysis of the theses and dissertations made in the field of CEIT. These findings could be said to be largely consistent with those of a study conducted by Durak et.al, (2018).

Participants

Table 3 shows the number and percentage analyses of the participant groups in the theses and dissertations included in the study. At the same time, the sample sizes of each participant group are presented as min-max values.

Table 3. Participants

Participants	Frequency	Percentage	Sample Size
K12 Students	75	%40	3 – 19166
Undergraduate Students	37	%19	10 – 24220
K12 Teachers	34	%18	2 – 3804
Academicians	10	%5	7 – 258
Experts	8	%4	7 – 35
Institutions	7	%4	1 – 126
Adult	2	%1	15 – 865
K12 Administrator	2	%1	5 – 188
Others	15	%8	
TOTAL	190	%100	

One study may employ more than one target group

When Table 3 is examined, it is seen that K12 students (40%), undergraduate students (19%) and K12 teachers (18%) took the first three places. These three types of participants correspond to a very large part of the total participants. The participant types in the review studies conducted in the literature (Akbaba et al., 2018; Altinpulluk, 2018; Aydin et al., 2019; Bozkaya et al., 2012; Dasdemir et al., 2018; Durak & **Cankaya**, 2018; Durak & **Cankaya**, 2020; Durak et al., 2017; Erdogmus & **Cagiltay**, 2009; Kunduracioglu & Durak, 2018; Kurt et al., 2009; **Ozerbas** & Egin, 2017; **Oztop** & **Ozerbas**, 2018; Sari & Taser, 2018; Sunger, 2019; Tongel et al., 2020; Uygun & Sonmez, 2019; Yildiz et al., 2020) were similar to those in the present study. The data of the theses and dissertations with samples including document analysis and with samples including associate degree students, parents, master's students, employees, orthopedically disabled individuals and application users, who were all used only once as a participant type, were gathered in the group named "Others" (8%).

Data Collection Tools

The number and percentage analyses of the data collection tools in the theses and dissertations included in the scope of the study are given in Table 4.

Table 4. Data Collection Tools

Data Collection Tools	Frequency	Percentage
Scale	87	%27
Interview	64	%20
Pre-test Post-test	48	%15
Questionnaire	42	%13
Observation	16	%5
Academic Achievement Test	14	%4
Document Analysis	6	%2
Log	4	%1
Focus Group	4	%1
Web Page Analysis	2	%1
Other	35	%11
Total	322	%100

One study may employ more than one data collection tools

When the data in Table 4 were examined, it was seen that scale (27%), interview (20%) and pre-test and post-test (15%) were among the top three data collection tools used. In related literature, there were also some other studies supporting these findings (Durak and Cankaya, 2018; Durak et al., 2018; Konan, 2020; Ozerbas & Egin, 2017; Sari & Taser, 2018; Sunger, 2019). However, it was generally seen in the review studies that questionnaire was the most used data collection tool.

Data collection tools such as spatial visualization and mental rotation test, class participation inventory, application reliability form, material evaluation form, social validity form, robotic satisfaction test and screen-shot data which were used only once were gathered in the category of "Other" (n=35).

Leading Contributor Institutions

In relation to the theses and dissertations considered within the scope of the analysis, Figure 5 presents the number of studies of the first 10 universities which conducted the highest number of studies.
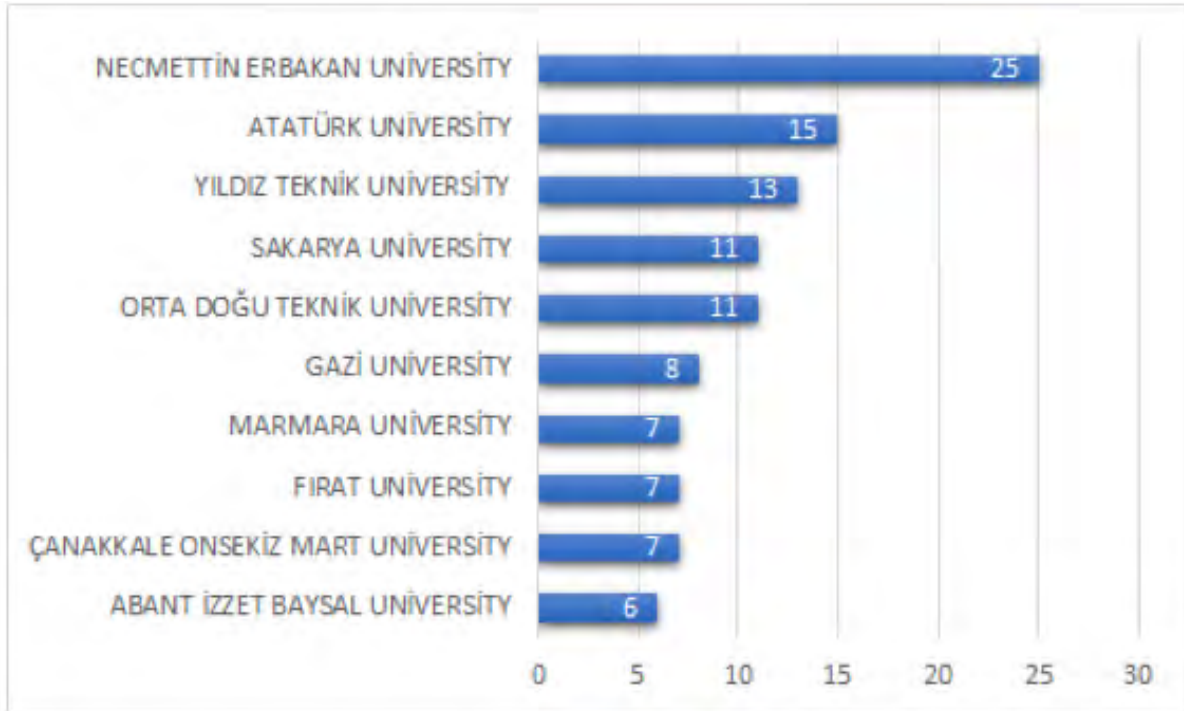

Figure 5. Leading Contributor Institutions

When the data in Figure 5 were examined, it was seen that of all the 156 studies, 25 of them were conducted at Necmettin Erbakan University, 15 of them at Ataturk University and 13 of them at Yildiz Technical University. It was an important finding that Necmettin Erbakan University, which was in the top rank, had a large share in post-graduate theses and dissertations despite being a new university established in 2010. The other universities in the list were among the universities that were included in previous review studies (Durak et al., 2018).

Tests and Analysis

Table 5 shows the number and percentage analyses of the analysis techniques in the theses and dissertations included in the scope of present study.

Table 5. Tests and Analysis

QUANTITATIVE					
Statistical Tests					
Descriptive (%38)		Inferential (%62)			
		Parametric (%77)		Non-Parametric (%23)	
Central Tendency (Mean/Median/Mode)	96	t-test	78	Chi-square	29
Relative Standing (Percentage/z-scrore)	81	Variance Analysis (Anova/Manova/Mancova)	54	Mann Whitney U	39
Variability (Variance/Standard Deviation/Range)	99	Reliability Analysis (Cronbach'a Alfa)	65	Wilcoxon Test	14
Descriptive Statistics (Non-Specified)	11	Correlation (Pearson)	75	Kruskal Wallis	23
		Factor Analysis (Confirmatory/Exploratory)	50		
		Regression Analysis	29		
		Structural Equation Modeling (SEM)	8		

When the data in Table 5 were examined, it was seen that the most used analysis method in descriptive analysis methods was included in the variability category consisting of the analyses of "Variance, Standard Deviation, Range" (n = 99). The most used analysis method in parametric analysis methods was T-test (n = 78), while the least used analysis method was the Structural Equation Model (n = 8). These findings were in line with the findings of other studies in the literature (Durak et al.,2018; Goktas et al., 2012; Kilic-Cakmak et al., 2013; Kurt et al., 2009; **Simsek** et al., 2008, 2009). The most used analysis method in non-parametric analysis methods was Mann Whitney U (n = 39), while the least used analysis method was Wilcoxon Test (n = 14).

Variables/Research Interests

The theses and dissertations examined in the study were categorized as dependent variables and listed according to frequency and percentages as shown in Table 6.

Table 6. Variables/Research Interests

Variables/Research Interests	Frequency	Percentage
Academic-Performance	45	%20,4
Effectiveness	30	%13,6
Perception	27	%12,2
Attitude	21	%9,5
Self-Efficacy	15	%6,8
Motivation	8	%3,6
Usability	7	%3,2
Addiction	7	%3,2
Opinion	7	%3,2
Competence	6	%2,7
Behavior	4	%1,8
Readiness	4	%1,8
Other	40	%18,1
Total	221	%100

When the dependent variables in Table 6 were examined, it was seen that the variables of Academic-performance (20.4%), Effectiveness (13.6%) and Perception (12.2%) variables were in the first three places. These three dependent variables correspond to approximately half of the total variables. These findings were also similar to the findings of the study conducted by Durak et al. (2018). Variables such as level of developing coding skills, Internet use, Digital Citizenship level and self-learning level, which were used three times or less as dependent variables, were collected in the category of "Other" (18.1%).

Theoretical/Conceptual Framework

When Figure 6 was examined, it was seen that the most used theoretical foundation in the master's theses and doctoral dissertations included in the scope of the present study was Cognitive Load Theory and Motivation Theory. These theories were followed by Computational Thinking, Diffusion of Innovation Theory, Multimedia Learning Theory, Project Based Learning and Social Cognitive Theory. However, only 12% of 156 the theses and dissertations examined had a theoretical foundation. This situation is parallel to the findings of a study conducted by Durak et.al (2018), who revealed that not many theoretical foundations were used in the master's theses and doctoral dissertations in the field of CEIT. Considering that the related study examined the theses and dissertations conducted until 2016, these results could imply that there is no change in the theses and dissertations conducted recently and that most of the theses and dissertations did not include any theoretical foundation at all.

Figure 6. Theoretical/Conceptual Framework

Research Design

Table 7 presents the percentage analyses of research methods and research designs in the theses and dissertations included in the present study.

<div align="center">Table 7. Research Method and Design</div>

Method	f	%	Model/Design	f	% CUM	% TOTAL
Quantative	84	53,85	Survey	47	56	30,13
			Experimental	29	34,5	18,59
			Causal Comparative	0	0	0
			Correlational	7	8,3	4,49
			Meta-analysis	1	1,2	0,64
Qualitative	26	16,67	Case Study	20	76,9	12,82
			Content Analysis	1	3,8	0,64
			Etnography	1	3,8	0,64
			Descriptive	0	0	0
			Phenomenology	3	11,5	1,92
			Grounded Theory	0	0	0
			Narrative	0	0	0
			Meta-Synthesis	1	3,8	0,64
			Delphi	0	0	0
			Historical	0	0	0
			Heuristic	0	0	0
			Discourse analysis	0	0	0
Mixed	40	25,64	Explanatory sequential	21	52,5	13,46
			Embedded	4	10	2,56
			Convergent Parallel	11	27,5	7,05
			Exploratory Sequential	3	7,5	1,92
			Multiphase	1	2,5	0,64
			Transformative	0	0	0
Conceptual/Descriptive /Other	0	0	Opinion Paper	0	0	0
			Literature Review	0	0	0
			Report	0	0	0
			Reflection Paper	0	0	0
			Comparative	0	0	0
			Technical Paper	0	0	0
			Position Paper	0	0	0
			Field Notes	0	0	0
			Narrative Review	0	0	0
			Systematic Review	0	0	0
Practice Based	5	3,21	Design Based Research	5	100	3,21
			Action Research	0	0	0
Data Mining and Analysis	1	0,64	Learning Analytics	0	0	0
			Social Network Analysis	0	0	0
			Text Mining	1	100	0,64
			Log Analysis	0	0	0
			Internet and Traffic Ranks	0	0	0

When the data in Table 7 were examined, it was seen that Quantitative (n = 84) methods were used in more than half of the theses and dissertations (53.85%) conducted in the field of CEIT. Quantitative methods were followed by Mixed (n=40) methods with 25.64% and qualitative (n=26) methods with 16.67%. Many studies conducted in the literature which preferred quantitative methods more (Akbaba et al., 2018; Alper and Gulbahar, 2009; Aydin et al., 2019; Bozkaya et.al., 2012; Celik, 2016; Dasdemir et.al., (2018); Durak and Cankaya, 2018; Durak et.al., 2018; Erdogmus and Cagiltay, 2009; Konan, 2020; Kunduracioglu and Durak, 2018; Kurt et.al., 2009; Oztop and Ozerbas, 2018; Tosuntas et al., 2019; Tongel et al., 2020; Uygun & Sonmez, 2019; Yildiz et al., 2020) support the present study. Among the master's theses and doctoral dissertations examined, apart from these three methods, Practice Based was used in five theses/dissertations and Data Mining and Analysis was used in one thesis/dissertation. Conceptual/Descriptive/Other methods were not found in any of the theses or dissertations.

In the studies conducted with the quantitative method, the most common design was the survey with 56% (n = 47), which was followed by the experimental design with 36%. In addition, it was seen that in this group, the meta-analysis design (n = 1) was used least with 1.2% and that the causal comparative design was not used. These findings are similar to those obtained in other review studies conducted in the literature (Aydin et al., 2019; Celik, 2016; Erdogmus & Cagiltay, 2009; Goktas et al., 2012; Kilic-Cakmak et al., 2013; Kurt et al., 2009; Sari & Taser, 2018; Simsek et al., 2008; Tosuntas et al., 2019; Tongel et al., 2020; Yildiz et al., 2020).

It was revealed that the case study method (77%) was used in most of the studies conducted with the qualitative method. Among the few other designs, Phenomenology (11.5%) and content analysis (n = 1), meta-synthesis (n = 1) and ethnography (n = 1) were used with 3.8%. The analysis conducted in the present study demonstrated that the descriptive, grounded theory, narrative, delphi, historical, heuristic, discourse analysis designs were not used. In the study carried out by Durak et al. (2018), it was seen as in the present study that the case study method was preferred most among qualitative methods.

In studies conducted with mixed methods, it was observed that the explanatory sequential design (n = 21) was used most with 52.5% and that the multiphase design (n = 1) was used least with 2.5%. In the review studies conducted in the related literature (Bozkurt et al.,2019; Durak & Cankaya, 2018; Kunduracioglu & Durak, 2018), the Explanatory sequential method was the most common method among mixed methods. Explanatory sequential design was followed by convergent parallel design (n = 11) with 27.5%. As a result of the theses and dissertations examined, it was seen that the transformative design was not used.

Among the theses and dissertations examined, it was seen that only the design-based research design (n = 5) was used among the designs in the Practice based method. Only the text (data) mining design (n = 1) was used among the designs within the scope of the data mining and analysis method. It was revealed that the designs of literature review, position paper, opinion paper, report, field notes, comparative, reflection paper, systematic review, technical papers and narrative review were not used within the scope of Conceptual/Descriptive/Other methods.

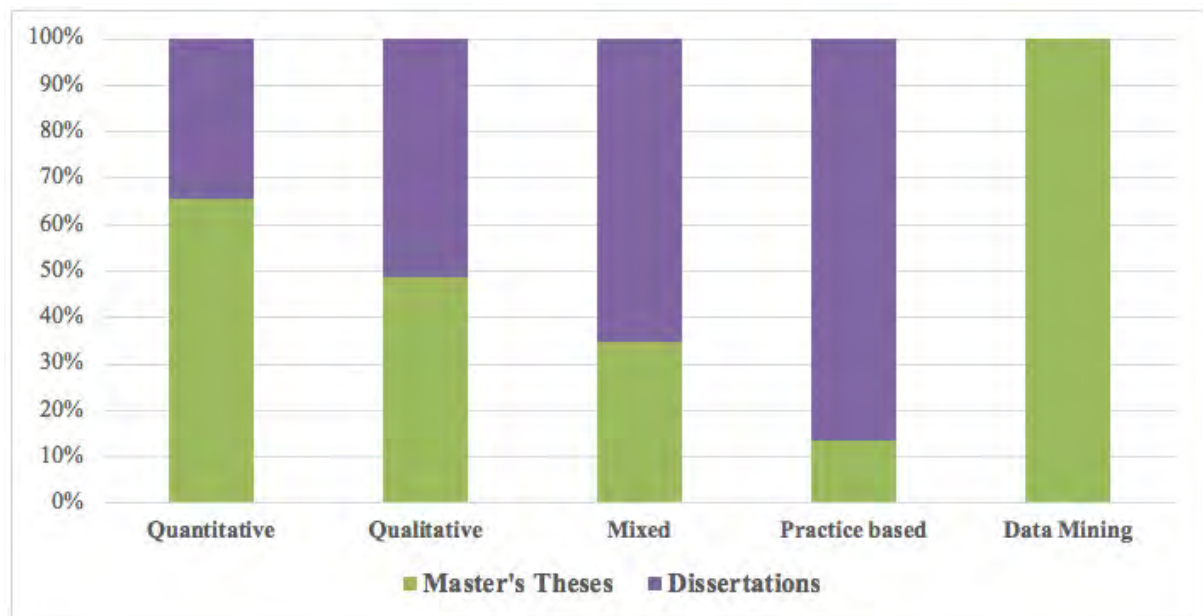The graph in Figure 6 was obtained when the methodology parts of the master's theses and dissertations examined.

Figure 7. The distribution of research methods according to master's theses and dissertations.

According to Figure 6, quantitative methods were preferred more frequently in master's theses than in doctoral dissertations. This ratio was equivalent to each other in qualitative methods; however, when analyzed in terms of mixed methods, mixed methods were used much more in doctoral dissertations. Similarly, in

terms of practice-based methods, the ratio was higher for the doctoral dissertations. Looking at the graph in general, it could be stated that methods especially like mixed methods and practice-based methods requiring more effort than other methods were preferred in the dissertations.

When the models and designs used in a total of 156 theses and dissertations included in the scope of the present study were examined as a whole, it was seen that survey with 30.13% and experimental design with 19% constituted almost half of the total theses and dissertations. These two designs were followed by the mixed method of explanatory sequential with 13.5% and by the qualitative method of case study with 12.8%.

Limitations and Strength

Within the scope of this study, the TCHE database was searched, and 162 master's theses and doctoral dissertations with access permission which were related to the research topic examined were reached. In terms of the research topic, two studies outside of the field of education, three studies that were not conducted in the Department of CEIT and one study that did not meet the criteria were excluded from the study. The fact that the theses and dissertations without access permission were not included in the scope of the present study and that only the theses and dissertations conducted in the last three years were examined could be regarded as a limitation of our study.

This study is considered important since it tried to reveal the current situation of studies conducted in the fields of Educational Technology and distance education in Turkey by systematically examining master's theses and doctoral dissertations conducted in the last three years in the country. In this respect, it is thought that the findings of the study will be a guide for future research.

CONCLUSION

This study involves systematic analysis of master's theses and doctoral dissertations conducted in Turkey in the field of CEIT, which gathers the areas of Educational Technology and Distance Education. These theses and dissertations were systematically examined in terms of keywords, academic discipline, research areas, theoretical frameworks, research designs and models, variables and determining the related institutions. Out of 162 theses and dissertations in total, six were excluded for various reasons, and the study was carried out with 156 theses and dissertations. When the theses analyzed were examined in terms of "Keywords", it was seen that the concept of "Achievement" was prominent. This concept was followed by "Attitude" and "Online learning". Based on the fact that these three keywords had almost the same distribution in the theses and dissertations, it could be stated that the CEIT field can be considered as a unifying field of educational technology and distance education. When evaluated in terms of theoretical foundations, it was found that theoretical foundations were used in a small portion of the theses and dissertations (13%). This is not a desired situation in postgraduate studies. According to Maxwell (2013), the use of the theory helps the researcher refine goals, develop research questions, discern methodological choices, identify potential threats to validity and demonstrate the relevance of the research. In the study conducted by Durak et al. (2018), the rate of theoretical foundations used in doctoral dissertations had a value of 46%, while in this study examining master's theses and doctoral dissertations conducted in the same field for the last 3 years, it was seen that this rate increased to 13%. In order to clarify this situation, it could be sadly stated that the theoretical foundations in the field of CEIT are used less and less in postgraduate education.

When looking at the research methods in the master's theses and dissertations, it was seen that quantitative methods were used most. This was followed by mixed/triangulation methods and qualitative methods. Almost all of the theses were designed with these three methods. While quantitative methods were mostly preferred in master's theses, mixed methods are favored more in doctoral dissertations. In terms of the practice-based methods that were included in a small number of theses, the situation was in more favor of doctoral dissertations. In general, it was not surprising that methods requiring more effort and expertise were used in doctoral dissertations, especially when compared to other methods such as "mixed" methods and "practice-based" methods. This result is supported by the result of a study conducted by Durak et al. (2018),

who reported that mixed methods were used most in doctoral dissertations in the same field.

When research methods, keywords and dependent variables were evaluated together, it was easily seen that the quantitative methods' taking the first place had a natural relationship with more use of keywords like "achievement" and "attitude" and more use of dependent variables like academic-performance and effectiveness. Another result that will support this relationship is that scale and pretest-posttest were preferred among the most used data collection tools.

The most preferred participant group in the studies included K-12 students. K-12 students were followed by graduate students and K-12 teachers. It could be stated that it was an unexpected result for K-12 students to be in the first place. It is known that obtaining the necessary permissions for studies on K-12 students is much more challenging than for studies on undergraduate students.

In this study, which examined the master's theses and dissertations conducted in the last three years, it was seen that there was a gradually decreasing trend by year when the number of the theses and dissertations was analyzed. The ratios were 65% for 2018, 20% for 2019 and 15% for 2020. Among the reasons for this decrease could be said to include reduction in the number of students in the department of CEIT in Turkey and the decline in the number of master's students accordingly. Another reason for the decline in 2020 could be the influence of the pandemic. Since not all educational institutions in the country have been able to provide face-to-face education for a long time, it could be thought that researchers might have difficulty in completing their theses. Finally, in this study, the universities where the theses were conducted were listed under the title of "leading contributors". Of all the 156 studies, 25 of them were conducted at Necmettin Erbakan University, 15 at Ataturk University and 13 at Yildiz Technical University, and these universities were the first three. Especially Necmettin Erbakan University was not expected to be in the first place. Based on this situation, it could be stated that the related department of the university established in 2010 was very active in postgraduate studies.

Based on the findings of this research, the following implications could be taken into consideration in future studies:

- It will be beneficial for researchers to benefit from the findings of our study in their thesis studies in the fields of Educational Technology or Distance Education, which will make it possible to see the trends in these fields,

- This study examined only the master's theses and doctoral dissertations conducted in the last three years. This time period can be further extended with the participation of wider groups of researchers.

- Researchers are recommended to conduct studies comparing the results of review studies in the literature.

- When the master's theses and dissertations examined were evaluated in terms of methodology, it was seen that quantitative methods were generally used in MTs and mixed methods and practice-based methods more frequently in Dissertations. The use of more mixed methods in master's theses is thought to allow getting a deeper understanding and more robust research results. In this respect, thesis supervisors could direct their students towards mixed methods.

- It is not a desirable situation that among the 156 master's thesis and dissertations, only 13% of them had a theoretical foundation. In future studies, the fact that both researchers and thesis supervisors base their theses on a theoretical foundation will provide better-quality and more valid thesis studies.

- In the theses examined within the scope of the present study, it was seen that the participants mostly belonged to the K12 student group. It could be stated that studies focusing on different participants are necessary to reach broader and diverse findings in the fields of CEIT (ET + DE).

- Lastly, it is thought that universities should encourage both practical and theoretical research in the field of educational technology. In this way, positive developments can be observed in the success, attitude and expectations of students by testing the adaptation of new technologies to education and including appropriate technologies in educational activities.

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