Educational Technology Research Trends in Turkey: Investigating Graduate Theses in English Language Teaching

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Article Info	Abstract
	The goal of the present study is to investigate educational technology research trends across graduate thesis written in the field of English language teaching and learning between 2016 and 2020 in the context of Turkey. A total of 146 theses were examined by means of a descriptive content analysis methodology. The findings of the study demonstrated that the research focus of the theses was dominated by attitudinal studies and research exploring digital literacies and 21st century skills, while four groups of technologies were strongly prevalent across the theses, which were CALL resources in general, video-based materials, skill-based Web 2.0 tools, and learning management systems (LMS) and e-learning platforms. It was also found that the majority of researchers adopted mixed-methods approach, commonly employed survey, interview, and achievement tests as data collection tools, and frequently analyzed the data by means of quantitative analysis methods. Following the discussion of each finding within the context of both educational technology and English language teaching scholarship, the study concludes with several suggestions in the light of the results.

Introduction

The rapid development of information and communication technologies has created new avenues for education including language teaching and learning contexts. The ubiquity of internet technologies, particularly mobile devices with internet service, provided opportunities for learners to engage in a multitude of literacy practices without spatiotemporal limitations (Kessler, 2018). These changes sparked a growing interest in educational technology research, which systematically addressed the integration and impact of technologies into educational contexts across the world (Yıldız, Cengel, & Alkan, 2020). The high number of research exploring educational technologies facilitated an increase in review studies, in which different aspects of such technologies were analyzed (e.g., Chen,

Chen, Jia, & An, 2020; Strelan, Osborn, & Palmer, 2020). Such a comprehensive analysis of research in a particular topic can provide a deeper and clearer understanding of the phenomena investigated (Dirlikli, Aydın, & Akgün, 2016). A similar strand of research exploring the role of digital technologies has also emerged in the contexts of second language teaching and learning (e.g., Parmaxi & Zaphiris, 2016; Shadiev, Hwang, & Huang, 2017). However, there remains a dearth of research analyzing educational technology research trends in certain fields including English language teaching. Therefore, it is the intention of the present study to address this discrepancy through investigating the research trends across graduate theses with a focus on educational technologies, which are published between 2016 and 2020 in the field of English language teaching in the context of Turkey.

Digital competence training, pre-service teachers have improved in using information searching strategies, accessing information, evaluating the validity and reliability of information, organizing and storing information (Çebi & Reisoğlu, 2019). Digital competence trainings improved preservice teachers' skills of searching for information on the web (Ramírez-Montoya, Mena, & Rodríguez-Arroyo, 2017). The purpose of this study is to find out if there is any gap of teachers between their Online Education skills. We are residing in a planet where technology is contemporary in our life routines. Online Learning is one of the vastest revolutions in individuals' lifespans. They give mobility and excitement to its users that these modern technological devices become most significant part of many people's lives. From online banking to watch the news on TV, we are confronting the progressions and affects that convey to our lives. Schools couldn't stay out of these online progressions and a wide range of classrooms had been altered, giving its place to virtual classrooms, from special spaces for the perusing of scholarly messages being delivered via social media platforms to sight and sound spaces, where the utilization of data and correspondence innovation had accomplished incredible significance in Online learning.

Literature Review

The present section lays out a brief review of the literature exploring educational technology trends in English language teaching and learning spaces within the context of Turkey. Considering the limited number of research in this particular area, the trends across the previous research in Turkish context are covered from two main perspectives: the

research trends in the field of educational technology, and the syntheses centered on the trends in English language teaching.

Prior studies were synthesized in terms of both educational technology in general (e.g., Yıldız et al., 2020) and the use of educational technology particularly for language teaching and learning purposes (e.g., Parmaxi & Zaphiris, 2016) in a worldwide setting. A similar trend was followed for the scholarship in educational technology (e.g., Gökmen et al., 2017) and English language teaching in the context of Turkey (e.g., Özmen, Cephe, & Kınık, 2016). While some of the research explored the trends across the scholarship by mainly analyzing graduate theses (e.g., Uzunboylu & Kocakoyun, 2016), others synthesized research published in internationally indexed journals as well (Solak, 2014). It is also important to note that a majority of the scholarship conducting research synthesis was published in 2016 or later, which illustrate a recent picture of the trends in the scholarship.

Content analyses of the educational technology study trends in Turkey were performed in multiple studies including an early research by Göktaş et al. (2012), who investigated Turkish educational technology research published between the years of 2000-2009. The analysis revealed that educational environments and technology were frequently at the center of the research, while questionnaires and quantitative analyses were employed as data collection tools and quantitative analysis method, respectively. Similarly, an extensive content analysis, which focused on the articles published by Turkish authors between 1990 and 2011 in the field of educational technology (Küçük, Aydemir, Yildirim, Arpacik, & Goktas, 2013), showed that educational environments and technology, multimedia, and distance education were the most commonly studied subjects. Interviews and questionnaires were frequently adopted as data gathering tools, while sample participants often featured preservice teachers and other undergraduate students. Analyzing doctoral research in educational technology in the Turkish context, Durak, Çankaya, Yunkul, and Mısırlı (2018) found that interview, questionnaires, and scales were frequently used for data gathering purposes, and the participants often included university students. Unlike the previous research, mixed method was the most commonly used method in dissertations in educational technology. Another area of research concentrated on particular aspects of educational technology research such as distance education in Turkey. For example, Gökmen

et al. (2017) analyzed research trends on distance education graduate research produced between 2005 and 2014, Durak et al. (2017) examined master's theses on distance education in higher education context between 1986 and 2015. Both studies showed that quantitative methodology was the most frequently adopted research design, while survey/questionnaire was the most commonly used method to collect data. In addition, both descriptive and inferential analyses were adopted for data analysis, which commonly gathered from undergraduate students and adults.

Given the focus of the present study on educational technology theses in English language teaching and learning, it is worthwhile examining research trends across the articles and theses published in the relevant field of study in the context of Turkey. Being one of the studies investigating the research trends across papers published between 2009 and 2013, Solak's (2014) synthesis revealed that quantitative method was employed the most, while the commonly preferred sample group was undergraduate students and 31-100 sample size was the most common group. In another study, Yağız, Aydın, and Akdemir (2016) reviewed research articles published in journals between 2005 and 2015, and found similar results in terms of research design, data collection tool, sample group and sample size. They have also noted that language acquisition/learning, language teaching, and teacher education were themes which were commonly investigated. In another research exploring the abstracts of English Language Teaching (ELT) research in a Turkish journal database platform, Cesur, Kök, and Aydın, (2018) found that teacher education, curriculum and teaching materials, and language teaching were frequently examined by researchers, undergraduates were the most common participant group, and sample size was 31-100 in the majority of the research. Finally, in their comprehensive review of Turkey-based ELT research, Aydınlı and Ortaçtepe (2016) showed that main topics of investigation were centralized around language learning and learners, English language teaching and language teachers, and in-service and pre-service teacher education/professional development.

The other research strand consisted of studies performing content analysis of master's and doctoral theses published in ELT scholarship in Turkey. In an early study, Kırmızı (2012) found language skills, teaching method, psychology and language teaching as the widely researched areas of study across master's theses. Examining doctoral research between 2009

and 2013 in ELT, İnal, Özdemir, Kıray, and Oral (2016) reported that classroom teaching and learning was at the center of attention in the majority of research, while theses often featured quantitative research methodologies and adult learners as sample groups. Exploring doctoral research in the same context, Özmen et al. (2016) found that multiple aspects of Teaching English as a foreign language (e.g., teaching language skills, certain variables such as learner and teacher) were among the commonly examined areas, while dissertations investigating young learners were reported to be quite limited. Finally, Şişman, Büyükkarcı and Özyurt (2019) documented the broad picture of the research trends across ELT graduate theses and reported that a) vocabulary and assessment were the most common choices as the topic of investigation, b) sample size in the research was often 31-60, and c) mixed method was the most preferred method. Several studies have also synthesized graduate thesis research by focusing on a particular aspect such as coursebooks and preparatory schools. To illustrate, Şimşek and Dündar (2017) undertook an analysis of research trends in English as a Foreign Language (EFL) coursebook evaluation across graduate theses, and Koçyiğit and Erdem (2018) examined graduate research on English preparatory classrooms at Turkish higher educational settings.

Despite a growing body of content analysis research in the fields of educational technology and English language teaching, the research has yet to document educational technology research trends in ELT contexts in Turkey. In an effort to address the gap in the previous scholarship, the present study aims to analyze ELT graduate theses featuring educational technologies for the period between 2016 and 2020 through the formulated research questions below:

1. What is the distribution of exterior characteristics of the educational technology research in ELT contexts? (type of thesis, year and place of publication)

2. Which topics were commonly investigated in educational technology research in ELT contexts?

3. What kinds of technologies were featured in educational technology research in ELT contexts?

4. Which methods were commonly adopted in educational technology research in ELT contexts?

5. What are the common data collection tools employed in educational technology research in ELT contexts?

6. Which data analysis methods were utilized in educational technology research in ELT contexts?

7. What are the sampling features of the in educational technology research in ELT contexts?

    a. Which sample groups were commonly preferred?

    b. Which sample size range was frequently selected?

Methodology

The present study investigated educational technology theses and dissertations written in the area of English language teaching and learning in the context of Turkey from January 2016 through September 2020. The study adopted a descriptive content analysis methodology, which allows researchers to analyze the collected data to classify the content with respect to general tendencies, emerging themes and trends through a descriptive approach (Yıldırım & Şimşek, 2013). The selected theses were systematically analyzed to demonstrate certain characteristics, and methodological trends of educational technology theses conducted in connection with ELT scholarship in Turkey.

Data Collection

The present study comprised master's theses and doctoral dissertations in the intersection of educational technologies and English language teaching and learning. As part of the data collection, graduate theses were gathered through the online electronic thesis database of the Turkish Council of Higher Education (TCHE). The following criteria were devised for the present study; a) The thesis had to be published in the field of English language teaching and learning between 2016 and 2020 (by September), b) The focus of the research had to be related to a single or multiple aspects of educational technology within the context of Turkey, c) The thesis had to be publicly accessible through TCHE's thesis database. The selected theses were identified through the online database's advanced search tool, which allowed the researcher to reach the complete list of master's and doctoral theses published in the department of English language teaching. In order to avoid missing a relevant thesis, the advanced search was performed multiple times as there were

institutional variations in terms of thesis categorizations (i.e., English Language Education Department, English Language Department, English Language Teaching Department, English Language Teaching). Following the identification of approximately 700 theses according to the first criterion, a total of 149 works featuring an educational technology were found to comply with the second criterion. Finally, three theses were excluded as they were not publicly accessible in the online database system. As a result, a total of 146 theses were used.

Data Analysis

A combination of coding frameworks was utilized for data analysis in the present study. While one of them (Güler & Taş, 2020) was employed as it was exclusively used for the analysis of theses in pre-school science education research, the other one (Yağız, Aydın, & Akdemir, 2016) was preferred for the fact that it was adopted for the examination of publications in the field of ELT. Given the focus of the present study on theses, an adapted version of the coding framework used by Güler and Taş (2020) were selected as the chief analysis method (Table 1). The parameters used in the study were based on both exterior (place of completion, year, type), and content (research and technology focus, research design, data collection tools and analysis, participant groups and sample size) features of the examined theses. Each thesis was investigated through the use of the adapted parameters and presented in multiple formats such as frequency and percentage following the process of analysis.

Table 1. The parameters adopted for the analysis of theses in the present study

Theme	Sub-theme	Description
Exterior features	Place of completion	The university where the work was completed
	Year and Type	The year completed and type of thesis (Master's/Doctoral)
Content features	Research focus	Main theme(s) of the study
	Technology focus	Educational technology/ies used for the study
	Research design	Quantitative, Qualitative, Mixed-methods
	Data collection tools	Interview, survey, observation etc.
	Data analysis	Descriptive, inferential, qualitative
	Participant groups	Teachers, students, parents etc.
	Sample size	The number of participants

Findings

This section features the presentation of the findings by means of the tables created following the analysis of master's and doctoral theses examined in the present study. The findings are presented in accordance with the coding framework and shared in two main categories: Exterior characteristics and content features.

Findings Related to Exterior Characteristics of Theses

The findings are presented with respect to exterior characteristics of theses in this section.

Table 2. Distribution of theses by its type and university

Theme	Code	Master's thesis	Doctoral thesis	tf	%
	Bahçeşehir University	26	2	28	19.18
	Çağ University	17	2	19	13.01
	Çukurova University	12	3	15	10.27
	Ufuk University; Uludağ University*	14	0	14	9.59
	Middle East Technical University	8	1	9	6.16
	İstanbul University (Cerrahpaşa); Sabahattin Zaim University*	8	0	8	5.48
	Akdeniz University; Gaziantep University; Pamukkale University; Samsun Ondokuz Mayıs University*	8	0	8	5.48
	Gazi University	6	1	7	4.80
	Hacettepe University	4	3	7	4.80
University Name	Abant İzzet Baysal University; Burdur Mehmet Akif Ersoy University; Dicle University; Kocaeli University; Maltepe University; Necmettin Erbakan University; Süleyman Demirel University*	7	0	7	4.80
	Balıkesir University	5	0	5	3.42
	Yeditepe University	3	2	5	3.42
	Çanakkale Onsekiz Mart University	1	3	4	2.74
	Anadolu University; Boğaziçi University	2	2	4	2.74
	Atatürk University	2	1	3	2.05
	Muğla Sıtkı Koçman University	3	0	3	2.05
Total		**126**	**20**	**146**	**100**

* Statistics are equally distributed across the universities.

As frequency and percentage of theses indicated in Table 2, the data comprised of 126 master's theses (86.3%) and 20 doctoral dissertations (13.7%) conducted across 28 different higher education institutions. A great number of ELT postgraduate theses (f = 62) featuring

educational technologies were conducted at three universities (Bahçeşehir, Çağ, Çukurova) with a combined ratio of 42.46%. A total of 82 theses were published by twenty-two state universities, which corresponds to an average of 3.72 theses per university, while the remaining 64 theses were conducted at six foundation universities, corresponding to an average of 10.66 theses per university. The fact that there are more master's theses is not surprising considering the relative scarcity of ELT doctoral programs compared to master's programs in Turkey. The number of educational technology-related ELT theses being high at certain universities is likely to be associated with the relevant expertise possessed by the faculty in those institutions.

Table 3. Distribution of theses by year

Theme	Code	Master's thesis		Doctoral thesis		Total	
		f	%	f	%	f	%
	2016	17	13.49	4	20	21	14.38
	2017	27	21.43	1	5	28	19.18
Years	2018	14	11.11	9	45	23	15.75
	2019	46	36.51	4	20	50	34.25
	2020	22	17.46	2	10	24	16.44
Total		**126**	**100**	**20**	**100**	**146**	**100**

Table 3, which displays the distribution of the examined theses by year, showed that the highest number of theses (f = 50) were completed in 2019. The overwhelming majority of the research conducted consisted of master's theses (f = 46), while the highest number of doctoral dissertations (f = 9) was achieved in 2018. As seen in the table below, the frequency of the total number of theses indicated that the number of research investigating educational technologies followed a relatively upward trend, which featured a major increase in master's theses in 2019. Given the fact that the last quarter of 2020 was not covered in the present study and the potential delays in graduate research due to COVID-19 outbreak in Turkish higher education context, it can be argued that the research exploring the technological phenomena in English language teaching and learning settings might follow a similar or potentially an upward trend more vertically when the epidemic outbreak is successfully under control.

Findings Related to Content Features of Theses

The findings with respect to content characteristics of the examined theses are presented in this section. The findings stem from the analysis of content-related areas such as

research and technology focus of the theses, research design, data collection tools, data analysis, participant groups, and sample size.

Table 4. Distribution of theses by research focus

Theme	Code	Master's thesis		Doctoral thesis		Total	
		f	**%**	**f**	**%**	**f**	**%**
	Attitudes and Perceptions	56	39.16	3	9.68	59	33.91
	Digital Literacies & 21st Century Skills	14	9.79	6	19.35	20	11.49
	Flipped Instruction Model	14	9.79	3	9.68	17	9.77
Research focus	Language Development and Use	15	10.49	1	3.23	16	9.2
	Gamification & Augmented Reality	10	6.99	1	3.23	11	6.32
	Learner Autonomy	7	4.9	4	12.9	11	6.32
	Motivation	6	4.2	3	9.68	9	5.17
	Distance Education	5	3.5	4	12.9	9	5.17
	Pre- and In-service Teacher Education	4	2.8	4	12.9	8	4.6
	Other	12	8.38	2	6.45	14	8.05
Total		**143**	**100**	**31**	**100**	**174**	**100**

According to Table 4, the research focus of the theses was varied although attitudinal studies and theses exploring digital literacies and 21st century skills nearly equaled half of the examined theses. Attitudinal research was particularly prevalent across master's theses (f=56) and it consisted of research exploring the perceptions, attitudes, beliefs, or opinions of various sample groups towards technological tools or technology-enhanced methodologies. Digital literacies, on the other hand, was the most popular research area for doctoral theses (19,35%, f = 6). The research in this group, which was categorized under the umbrella terms of digital literacies and 21st century skills, was comprised of studies investigating areas such as critical thinking, pragmatic and intercultural communication competences. It is noteworthy that the number of research focusing specifically on language development and use was relatively limited (9,2%, f = 16) despite being ranked as 4th in the list. Apart from the listed research focus areas such as flipped instruction model, learner autonomy, and motivation, the underexplored research topics, which were listed in the category of 'Other', included anxiety, concept mapping, English for specific/academic purposes, and future labs. These findings correspond well to the previous research with respect to the topics such as language learners and language teachers (e.g., İnal et al., 2016; Özmen et al., 2016), but they are in contradiction with the literature with respect to pre- and in-service teacher education (e.g., Aydınlı & Ortaçtepe, 2016; Cesur et al., 2018; Yağız et al., 2016). Considering these

results, it might be argued that educational technology research concerning pre- and in-service EFL teacher education is relatively limited in comparison with the number of teacher education research in the field of ELT in general. The findings regarding the research focus of the studies are also generally in line with the predominantly examined areas in educational technology research, which are reported as educational technology and environment and multimedia (e.g., Göktaş et al., 2012; Küçük et al., 2013). However, the number of research focusing on distance education is low compared to the research trends across the educational technology scholarship (e.g., Küçük et al., 2013).

Table 5. Distribution of theses by technology focus

Theme	Code	Master's thesis		Doctoral thesis		Total	
		f	%	f	%	f	%
Technology Focus	CALL resources (general)	34	22.82	5	22.73	39	22.81
	Video-based materials	31	20.81	4	18.18	35	20.47
	Skill-based Web 2.0 tools	29	19.46	4	18.18	33	19.30
	LMS & E-learning platforms	13	8.72	6	27.27	19	11.11
	Social networking sites	8	5.37	0	0.00	8	4.68
	Games & Gamifying tools	7	4.69	0	0.00	7	4.09
	Blogs	5	3.36	1	4.55	6	3.51
	Virtual/Augmented reality tools	5	3.36	0	0.00	5	2.92
	IWBs / Tablets	5	3.36	0	0.00	5	2.92
	Others	12	8.05	2	9.09	14	8.19
Total		**149**	**100**	**22**	**100**	**171**	**100**

Table 5, illustrating the distribution of the examined theses by technology focus, indicating that four groups of technologies were strongly prevalent across both master's and dissertation research: CALL resources in general, video-based materials, skill-based Web 2.0 tools, and learning management systems (LMS) and e-learning platforms. While the first group often included attitudinal research exploring participants' perceptions towards CALL or MALL resources (e.g., internet technologies, mobile applications) in general (f=39), the second group (i.e., video-based materials) consisted of technologies such as multiple TV series and commercials, animations, TED-Ed videos, video editing tools (e.g., *WE-Video, Screencastomatic*), and digital storytelling platforms such as *Animaker* (20,47%, f=35). Skill-based Web 2.0 tools, which specifically developed for improving a particular skill, were also frequently employed in the theses. Some of the examples included tools adopted for developing listening (e.g., audiobooks, *Randall's cyber listening lab*) , writing (e.g., *CYWrite,*

Google Docs), reading (e.g., annotation tools, e-readers), and vocabulary (e.g., *Rememba, Memrise*) (f=33). Finally, LMSs and e-learning platforms were commonly utilized in master's theses (8,72%) and particularly in dissertation research (27.27%). Such technologies consisted of mainstream LMSs (e.g., *Edmodo, Moodle, AdobeConnect*), systems that are developed to address the needs of a particular institution (e.g., Dicle University online LMS, Istanbul University AUZEF online platform), and systems that are designed specifically for language learning purposes (e.g., *Cambridge Unlock, MyEnglishLab*). In addition to these four categories, social networking sites (e.g., *Facebook, Twitter*), games and gamifying tools (e.g., MMOGs, *Kahoot*), blogs (e.g., *Wordpress, Blogger*), virtual and augmented reality tools (e.g., virtual/augmented reality apps such as *HP Reveal 2, Layar, VR Grocery*), interactive whiteboards and tablets, and others including corpora (e.g., *BNC, COCA*), and assessment tools (e.g., *Google forms, Socrative*). Although there is no similar study to make a direct comparison with these findings, it can be argued that these findings are not surprising as multimedia technologies are found to be commonly featured in educational technology research (e.g., Küçük et al., 2013). The finding regarding skill-based Web 2.0 tools also concurs well with the previous studies as language skills are frequently examined across ELT graduate thesis research (e.g., Şişman et al., 2019). What is perhaps surprising is that the investigation of socio-interactive web technologies such as social media and gamifying/augmented reality tools are almost non-existent across doctoral thesis research.

Table 6. Distribution of theses by research design

Theme	Code	Master's thesis		Doctoral thesis		Total	
		f	%	f	%	f	%
Research Method	Quantitative	29	23.02	3	15	32	21.92
	Qualitative	18	14.29	2	10	20	13.70
	Mixed-Methods	79	62.70	15	75	94	64.38
Total		**126**	**100**	**20**	**100**	**146**	**100**

As for Table 6, the research design of the theses displayed that the majority of researchers adopted mixed-methods approach as their preferred method of investigation (64.38%, f=94). Explanatory sequential design and convergent parallel design were among the most commonly adopted methods. Mixed-methods approach was found as the most popular research design across both categories of theses, and it was employed in as high as 75% (f=15) of doctoral theses. According to the statistical results, quantitative research

method was adopted in 23.02% (f=29) of the master's theses, while only 14.29% (f=18) of the master's theses featured qualitative method. Only a quarter of the doctoral theses employed either quantitative (f=3) or qualitative method (f=2). Qualitative research across the theses often consisted of single or multiple case studies as well as experimental and phenomenological research, while correlational studies, quasi-experimental, or descriptive research were mainly utilized in master's and doctoral theses adopting a quantitative approach. These findings are in accordance with the latest research syntheses (e.g., Durak et al., 2018; Şişman et al., 2019), but not in other studies, in which quantitative research design was found to be the most commonly used methodology in both educational technology and ELT research (e.g., Göktaş et al., 2012; İnal et al., 2016; Küçük et al., 2013; Solak, 2014; Yağız et al., 2016). This finding is perhaps not surprising given the present synthesis covers the period of 2016 and 2020, and there is an upward trend in tendency to use mixed-methods design in the recent years as indicated in the fields of educational technology (e.g., Durak et al., 2017) and ELT (Şişman et al., 2019).

Table 7. Distribution of theses by data collection tools

Theme	Code	Master's thesis		Doctoral thesis		Total	
		f	%	f	%	f	%
Data Collection Tools	Survey/Questionnaire	89	29.87	16	20.00	105	27.78
	Interview	80	26.85	14	17.50	94	24.87
	Knowledge/Achievement Test	63	21.14	16	20.00	79	20.90
	Reflection Paper/Journal	23	7.72	9	11.25	32	8.47
	Observation/Field note	15	5.03	9	11.25	24	6.35
	Participant Work	15	5.03	9	11.25	24	6.35
	Others	13	4.36	7	8.75	20	5.28
Total		**298**	**100**	**80**	**100**	**378**	**100**

Table 7, which shows the distribution of master's and doctoral theses by data collection tools, illustrated that three tools were the most commonly employed means of collecting data in both types of theses: survey/questionnaire (27.78%, f=105), interview (24.87%, f=94), knowledge/achievement tests (20.90%, f=79). Following these data collection tools, reflection papers or journals (e.g., teacher diary notes) and observation / field notes (e.g., screen capturing recordings) were commonly used as a means of gathering data for the research. The data were collected through participant work (6.35%, f=24) as well, which featured documents such as online peer feedback comments, participants' lesson plans,

assignments, learner essays, blog posts, and discussion forum posts. These findings are in tune with the literature, in which survey/questionnaire, interviews, and achievement tests were commonly reported among the preferred data collection tools (e.g., Durak et al., 2018; Göktaş et al., 2012; Solak, 2014)

Table 8. Distribution of theses by data analysis methods

Theme	Code	Master's thesis		Doctoral thesis		Total	
		f	**%**	**f**	**%**	**f**	**%**
Data Analysis Methods	Descriptive analysis	91	36.55	13	27.08	104	35.02
	Inferential analysis	58	23.29	17	35.42	75	25.25
	Qualitative analysis	100	40.16	18	37.50	118	39.73
Total		**249**	**100**	**48**	**100**	**297**	**100**

As displayed in Table 8, the gathered data were analyzed by means of quantitative (i.e., descriptive analysis and inferential analysis) and qualitative analyses. Quantitative analysis was the most preferred data analysis method across both master's theses (59.84%, f=149) and doctoral theses (62.5%, f=30). While descriptive analysis was more commonly adopted than inferential analysis in master's research (36.55, f=91), inferential analysis was employed more in doctoral theses (35.42, f=17). The types of inferential analyses that were statistically run in all types of theses consisted of non-parametric tests (e.g., Wicoxon Signed ranks, Mann Whitney U, Kruskal Wallis, Kolmogorov-Smirnov, Shapiro-Wilk tests), t-tests (e.g., paired sample, independent sample), ANOVA/ANCOVA, and regression analysis. The collected data in the theses examined were qualitatively analyzed in a relatively high percentage for both master's research (40.16%, f=100) and doctoral theses (37.50%, f=18). The means of qualitative analysis across both types of theses often featured content and thematic analyses, which were followed by other methods such as constant comparative analysis. However, only a limited number of research (f=10) adopted digital qualitative analysis tools for the purpose of data analysis. MAXQDA (f=6) was the most popular qualitative data analysis software, which was followed by NVivo (f=2) and Atlas.ti (f=2). Research syntheses in the literature generally support these findings (e.g., Göktaş et al., 2012) although some studies reported a balance between descriptive and inferential analyses unlike the present study (e.g., Durak et al., 2018). Considering the predominance of the quantitative research

across the analyzed research, it is not surprising to see quantitative analysis methods being employed more than qualitative analysis.

Table 9. Distribution of theses by participant groups

Theme	Code	Master's thesis		Doctoral thesis		Total	
		f	%	f	%	f	%
	Undergraduate students	57	40.14	8	36.36	65	39.63
	Pre-service EFL Teachers	14	9.86	9	40.90	23	14.02
	In-service EFL Teachers	18	12.68	2	9.10	20	12.20
	Univ.-level EFL instructors	16	11.28	1	4.55	17	10.36
	High school students (9-12)	13	9.16	1	4.55	14	8.54
Participant Group	Secondary students (5-8)	8	5.63	0	0	8	4.88
	Others	7	4.93	1	4.55	8	4.88
	Primary students (1-4)	5	3.52	0	0	5	3.05
	Faculty members	1	0.70	0	0	1	0.61
	Early childhood students	1	0.70	0	0	1	0.61
	Parents	1	0.70	0	0	1	0.61
	Documents	1	0.70	0	0	1	0.61
Total		**142**	**100**	**22**	**100**	**164**	**100**

Table 10. Distribution of theses by sample size

Theme	Code	Master's thesis		Doctoral thesis		Total	
		f	%	f	%	f	%
	31-100	67	53.17	5	25	72	49.33
	101-300	26	20.63	5	25	31	21.23
Sample number	11-30	21	16.67	6	30	27	18.49
	1-10	10	7.94	1	5	11	7.53
	301-1000	2	1.59	2	10	4	2.74
	more than 1000	0	0	1	5	1	0.68
Total		**126**	**100**	**20**	**100**	**146**	**100**

The research trends across the examined theses were analyzed by means of sample groups and sample size as well (Table 9, Table 10). Undergraduate students, commonly including preparatory class students (e.g., medicine, engineering), were frequently involved in a high number of master's thesis research (40.14%, f=57). Other participant groups included in-service EFL teachers, university-level EFL instructors, and secondary and high school students. Faculty members (0.70%), early childhood students (0.70%), parents (0.70%), and documents (0.70%), were the least chosen populations. University-level students (i.e., undergraduate students and pre-service EFL teachers) were included in more than three-quarters of doctoral thesis research (77.26%, f=17). The remaining participant groups across

doctoral theses were in-service EFL teachers (f=2), university-level EFL instructors (f=1), high school students (f=1), and others (f=1). The frequently preferred sample sizes were groups of 31-100 (49.33%, f=72), 101-300 (21.23%, f=31), and 11-30 (18.49%, f=27) in both master's and doctoral theses, which also provided insight regarding the preferred research designs. Findings regarding participant groups (i.e., undergraduate students) and sample sizes (i.e., 31-100 participants) concurred well with the findings from the literature, particularly in the field of ELT (e.g., Cesur et al., 2018; Solak, 2014; Yağız et al., 2016). The fact that young learners were included in the research in a limited way was also present in the previous research syntheses (e.g., Özmen et al., 2016). Therefore, it can be assumed that ELT research with an educational technology focus follows the similar trends of ELT studies with respect to sample groups and sizes.

Conclusion and Suggestions

The present study aimed to investigate English language teaching and learning-related educational technology theses for the period between 2016 and 2020 through a descriptive content analysis methodology. The theses were examined to illustrate research trends across both master's and doctoral theses in the context of Turkey and to shed a light on the broad picture of the field as well as paving the way for the future research and the policymakers. The findings indicated that the research focus of theses was attitudinal studies and research examining digital literacies and 21st century skills. It was found that four groups of technologies were strongly prevalent and these technologies were CALL resources in general, video-based materials, skill-based Web 2.0 tools, and learning management systems (LMS) and e-learning platforms. The findings further revealed that the majority of researchers employed mixed-methods approach, frequently employed survey, interview, and achievement tests as data collection tools, and often analyzed the data by means of quantitative analysis method. In the light of the present study's results, the following suggestions should be taken into consideration for future studies:

The educational technology research is growing quickly in the field of English language teaching and learning in the context of Turkey, which necessitates further research synthesis and analysis including periodicals in national and international indices. In addition, content analysis might focus on a specific aspect of educational technology (e.g.,

social media technologies, interactive web tools) or a language area/skill such as pronunciation, which is considered as one of the least studied areas in the EFL context (Arıkan & Yılmaz, 2020).

Based on the findings of the research synthesis regarding the limited number of qualitative methodology-oriented research, it is recommended that some future studies could adopt qualitative research techniques more in the examination of technology-enhanced English language teaching and learning practices. Besides, researchers should investigate the educational technology-related phenomena in ELT settings through longitudinal studies, which would further the knowledge in the scholarship. Given the dominance of quantitative data collection tools (i.e. questionnaires) in the field, it is also important that future studies rely on naturally occurring classroom data (İnal et al., 2016), which would enrich the results and provide a detailed inside perspective to the phenomena examined.

As the content analysis indicated a high percentage of undergraduate students' involvement in the studies, future research should target young learners as well. Considering the fact that children in Turkey are introduced to English as early as 2nd grade in public schools, the number of research featuring young learners should increase and have more representation in ELT research in general as well (İnal et al., 2016; Solak, 2014). Furthermore, other participant groups such as administrators and parents could be valuable to illustrate multiple aspects of technology use for second language teaching and learning purposes, thus yielding a wide range of results.

Regarding the topics of the investigation, the following areas are recommended for further examination: the role of technology in testing and assessment, learners' digital collaborative practices, the affordances of telecollaboration, in-service teacher education and online professional development, massively multiplayer online games, social networking sites and apps developed for language learning purposes (e.g., Duolingo), technology-mediated second language identity construction and development, intelligent technologies such as wearable devices and immersive technologies, and learners' digital translingual practices. Considering the developmental phase of digital technologies, ELT researchers exploring such technologies are suggested to follow technologies developments closely and

design their research through a deeply-rooted theoretical and methodological lens following an interdisciplinary approach.

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Authorship Contribution Statement

Osman SOLMAZ: *Conceptualization, design of the work, , literature search, data collection, data analysis, data interpretation, writing - review and editing.*

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Appendix 1. Theses included in the present study

Thesis	Title	Author*	Year
MA	English teachers' opinions about using songs to teach English to children (The sample of Diyarbakır city)	Çocuk	2016
MA	The effectiveness of augmented reality supported materials on vocabulary learning and retention	Doğan	2016
MA	Learning to teach English through sitcoms: A case study of pre-service EFL teachers	Ökcü	2016
MA	The relationship between student attitudes towards English and teachers' technology use in EFL classes	Selek	2016
MA	Examining the influence of flipped classroom on students learning English as a foreign language	Çalışkan	2016
PhD	Motivating and engaging EFL learners in e-learning with game elements	Özkan	2016
MA	The perspectives of English as a Foreign Language (EFL) instructors on the use of mobile applications as educational tools	Tutal	2016
PhD	The effect of audio and video modality on listening comprehension of reduced forms in sentential level: The role of web-based learning	Gülözer	2016
MA	EFL students' online peer feedback stances and preferences for revision	Albayrak	2016
MA	The role of using facebook in an EFL writing context and students' perceptions of it: A case study	Akçay	2016
MA	English language instructors' perceptions and use of interactive whiteboards in English as a foreign language classrooms	Murat	2016
MA	The perceptions and challenges of young learners' EFL teachers towards interactive whiteboard use in EFL classes	Güdücü	2016
MA	Exploring the role of digital storytelling in vocabulary learning and retention: A case study at Harran University	Özer	2016
MA	Teaching English for specific purposes through the use of information and communication technologies and multimedia in Turkish Military Academy: A study on YouTube	Küçükyılmaz	2016
MA	The investigation of technological pedagogical and content knowledge level by Turkish teachers of English	Delen	2016
MA	An experimental study on the effects of wikis on EFL writing motivation	Çelik	2016
PhD	The effects of explicit film-based instruction on English as a foreign language teacher trainees' interpretation of implied meanings	Çetinavcı	2016
MA	The effect of Second Life as a virtual language learning environment on speaking anxiety	Güzel	2016
MA	Investigating the impact of blogging and portfolio-keeping on English as a Foreign language learners' level of autonomy, self-assessment and language achievement	Orhon	2016
PhD	The impact of digital storytelling on English as a foreign language learners' writing skills	Uçar	2016
MA	An investigation into using blogs and the internet to improve the writing skills of EFL learners	Üzer	2016
MA	English instructors' attitudes toward mobile assisted language learning: A descriptive study	Demirer	2017
MA	E-learning through online assignments: EFL students' and EFL teachers' perspective	Zelyüt	2017
MA	A study on students' attitude towards computer assisted language learning and web-based games	Kızıl	2017
MA	Investigating the use of a mobile flashcard application Rememba on the vocabulary development and motivation of Turkish EFL learners	Köse	2017
MA	Enhancing EFL students' language learning through blogs	Sekmez	2017
MA	Teaching collocations through data-driven learning activities in a translation course for prospective ELT teachers	Akkoyunlu	2017
MA	Mobile- assisted vocabulary learning and its effect on vocabulary recall	Özer	2017
MA	In-service English teachers' use of information and communication technology for self-directed professional development	Erdem	2017
MA	Tweet circle: Effects of Twitter on EFL students' writing skill development	Ekinci	2017
MA	An investigation of English lecturers' attitudes toward information and communication technologies (ICT) and their use of technology	Öztürk	2017
MA	The effects of tablets on students' English vocabulary learning	Doğan	2017
MA	The effects of subtitled animation movies on the listening skills of EFL students	Ekinci	2017
PhD	Annotation and working memory in second language reading, incidental vocabulary learning, and perceived cognitive load	Varol	2017
MA	A blended academic writing course for medical students: Diognosing EAP writing needs and syllabus design	Kaplan	2017
MA	Data-driven language learning: The use of concordance lines in vocabulary learning	Tosun	2017
MA	The use of gamification in teaching foreign language vocabulary for beginners	Karatekin	2017
MA	The impact of Quizlet on performance and autonomy in vocabulary learning of Turkish EFL learners	Körlü	2017
MA	The effects of using corpus-based materials in vocabulary instruction	Çilak	2017
MA	A case study on teacher and student perceptions towards the online English exams	Çörekçioğl	2017

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MA	The perceptions of ELT students and teachers towards the use of IWBs at a vocational and technical high school	Elmacı	2017
MA	The contributions of using key-pal as a communication tool for English as a Foreign Language secondary school students	Varışlı	2017
MA	Foreign language teachers' interactions with their students on Facebook	Börekçi	2017
MA	A study on e-readiness of teachers in language classrooms	Çalışkan	2017
MA	The effects of flipped classroom model on learner autonomy	Çibik	2017
MA	A study of faculty members' and instructors' awareness, routines and use of Web 2.0 tools in foreign language teaching	Daşkın	2017
MA	Perceived roles and competencies of English language instructors in online learning environments	Güneş	2017
MA	The analysis of learner autonomy and autonomous learning practices in massive open online language courses (MOOLCD)	Mısır	2017
MA	Fostering students' L2 writing through interactive writing tools	Yılmaz	2017
MA	The impact of video-based asynchronous computer-mediated communication of EFL learners' oral language achievement and foreign language speaking anxiety	Özdemir	2018
PhD	21st century learning: Integration of web 2.0 tools in Turkish adult language classrooms	Demir	2018
MA	The use of multiplayer online computer games in developing efl skills	Altınbaş	2018
MA	Impact of flipped classroom model on EFL learners' grammar achievement: Not only inversion, but also integration	Bulut	2018
MA	Effects of online differentiated reading in reading comprehension skills and learner autonomy of young learners	Gülşen	2018
PhD	Possible effects of employing video recording as a self-monitoring tool on pre-service EFL teachers' reflectivity and teaching knowledge	Beceren	2018
MA	Exploring the effects of feedback types and wiki on EFL learners' writing performance	Altay	2018
MA	Students' attitudes to the roles of teachers in task based learning method through web-assisted practices	Koçak	2018
MA	Turkish EFL pre-service teachers' attitudes toward and reflections on digital game enhanced practice	Müftüoğlu	2018
MA	Comparison between Kahoot! and a traditional exercise in terms of vocabulary retention in EFL learners	Ünal	2018
PhD	Tailoring blended instruction to underachieving language learners in order to enhance their productive language skills	Aggun	2018
MA	The effectiveness of using songs in teaching vocabulary to very young learners in a foreign language teaching classroom	Yılmaz	2018
MA	The effects of critical thinking instruction through asynchronous learning tools on writing performance	Aygün	2018
PhD	An investigation into English student teachers' behavioral intention to use information and communication technologies	Baz	2018
MA	A case study on the online English conversation classes through the use of Live Learning Program (LLP)	Çelikbaş	2018
PhD	The role of mobile-assisted language learning (MALL) in vocabulary knowledge, learner autonomy and motivation of prospective English language teachers	Dağdeler	2018
PhD	Asynchronous distance learning and blended learning in terms of learner autonomy, motivation and academic success in teaching english	Güneş	2018
MA	Flipped and blended grammar instruction for B1 level EFL classes at tertiary education	Karakurt	2018
PhD	Reading comprehension in paper and digital based English texts: A comparative study	Kazancı	2018
MA	The effectiveness of virtual reality tools on vocabulary learning and retention	Koçbuğ	2018
MA	The effect of instrumental music and songs on vocabulary learning, reading comprehension and motivation in English as a foreign language: A quasi-experimental study with Turkish high school students	Sevinç	2018
PhD	The impact of telecollaboration on learners' intercultural communicative competence and ideal L2 self	Toscu	2018
PhD	The role of English language teachers' TPACK regarding high school students' acceptance of mobile learning tools	Yapar	2018
MA	Visually impaired can watch films, too: Assessing the effects of audio description via film narrations	Uulu	2019
MA	A study on the most commonly used Web 2.0 tools among Turkish high school teachers of English	Kayar	2019
MA	Exploring the effects of digital storytelling on young learners' motivation, vocabulary learning and retention in foreign language teaching	Bekar	2019
MA	An analysis of preparatory school EFL instructors' perceptions on integrating internet-assisted technologies into classroom use	Öztok	2019
MA	Let student learning drive the class: An investigation of the impact of flipped learning on EFL students' language skills, digital literacy and attitudes toward the learning environment	Tulay	2019
MA	The effect of metacognitive listening strategy instruction on EFL learners' listening comprehension and awareness levels and the role of TED talks as a listening resource on students' perceptions	Topaç	2019

MA	The effects of online EFL assignments on student success: Mehmet Akif Ersoy University (MAKU) Gölhisar Vocational School (GVS)	Yalçın	2019
MA	The impact of different media delivery modes on EFL learners' listening comprehension	Acar	2019
MA	An investigation on the relationship between technology adopter categories and technological pedagogical content knowledge level of pre-service EFL teachers	Şenen	2019
MA	Exploring factors that predict pre-service English teachers' intentions to use augmented reality using decomposed theory of planned behavior	Karacan	2019
MA	The impact of vocabulary learning strategies and computer assisted language learning on vocabulary development of Turkish high school students	Kılıç	2019
MA	Teachers' awareness and actual practices of 21st century learning and innovation skills	Orak	2019
MA	The views of ELT prep class students on internet-assisted language learning regarding learning management system	Dilfiruz	2019
MA	The effect technological tools on EFL learners' reading attitudes and motivations	Erdem	2019
PhD	In-service EFL teacher's research experiences in an online professional learning community: A qualitative multiple case study	Yıldırım	2019
PhD	The impact of flipped classroom approach on the reading and writing achievement, self-regulated learning, and classroom interaction of pre-service English teachers	Aydemir	2019
PhD	Developing digital literacies of pre-service EFL teachers through engagement with research	Altıner	2019
MA	An evaluation of the blended learning program of Ankara Yildirim Beyazit University preparatory school based on students' and instructors' perspectives	Bodur	2019
MA	Pre-service EFL teachers' current practices and perceptions of mobile assisted language learning	Aygül	2019
MA	The impact of CLIL and techno-CLIL implementations on Turkish students' L2 vocabulary proficiency and reading development	Ünsal	2019
MA	Flipped vocabulary learning among Turkish learners of English as a Foreign Language: A sequential explanatory mixed method study	Özkan	2019
MA	A case study in ninth grade students at a state school; differences between Kahoot! and traditional activities in terms of vocabulary retention	Emecen	2019
MA	Individual and collaborative computerized concept mapping as a pre-writing strategy: Effects on EFL students' writing	Sebit	2019
MA	An evaluation of a coursebook for 21st century's learning and innovation skills	Uluhan	2019
MA	Developing listening comprehension skill through metacognitive strategy training in a tablet-assisted learning environment	Şiringür	2019
MA	The use of CALL to foster learner autonomy in EFL: A quasi-experimental study	Kızmaz	2019
MA	A case study on innovative practices of English language teachers in flexible learning spaces	Eral	2019
MA	The effect of flipped learning-supported critical thinking instruction on the critical disposition and L2 writing skills	Alpat	2019
MA	Using Web 3.0 technologies for teaching English to the primary level students: A study on augmented reality	Bahadır	2019
MA	The integration of ICT tools into listening skill classes to improve listening comprehension of EFL learners	Bal	2019
MA	Learning vocabulary with a computer-based vocabulary flashcard tool in a Turkish EFL High School context	Bilcan	2019
MA	The effect of using audiobooks as an extensive listening strategy on anxiety and development of listening and pronunciation skills of high school students learning English as a foreign language	Bulut	2019
MA	The effects of automated writing evaluation on EFL students' writing achievement and motivation towards writing	Bulut	2019
PhD	The effect of blog writing on Turkish EFL high schoolstudents' writing and vocabulary development	Cellat	2019
MA	Learning English for academic purposes by using ubiquitous computing technology	Dağ	2019
MA	The effects of a mobile phone application on Turkish EFL students' grammar learning	Demirkesen	2019
MA	Collaborative social learning: Using Edmodo as a social platform to teach efl writing for preparatory school students	Doğan	2019
MA	Automated writing evaluation use in an EFL context: From paragraph writing to essay writing	Gençer	2019
MA	The role of cartoons in teaching grammar in EFL classes	Güller	2019
MA	Attitudes of ELT students and in-service teachers towards using mobile assisted language learning	Güven	2019
MA	Teaching foreign culture through songs	Karadeniz	2019
MA	On the role of short films in enhancing reading comprehension skills: Critical discourse analysis of perceptions of efl students	Lekealmaz	2019
MA	The effects of TV series as curricular activities on speaking skills of English language learners	Lengerlioğlu	2019
MA	Exploring the perceptions of language learners towards using a learning management system (LMS) at an English preparatory school	Oğul	2019
MA	The role of listening skills in the pronunciation of diphthongs through flipped classrooms	Özdemir	2019
MA	Comparing three different techniques for English vocabulary learning and retention	Punar	2019

MA	The effects of Flipped Learning Model in teaching English grammar	Seçilmişoğlu	2019
MA	The effect of flipped classroom on young learners' vocabulary learning in primary ELT classrooms	Şık	2019
MA	The effects of Quizlet on students' and EFL teachers' perceptions on vocabulary learning / teaching process	Toy	2019
MA	Investigating the impacts of mediated glosses on reading comprehension and vocabulary learning in foreign language	Yuca	2019
MA	A corpus-based study on the English used in automotive engineering: Implications for teaching English for specific purposes	Banlı	2020
PhD	Corpora in foreign language teacher education: Introducing a corpus literacy course to ELT pre-service teachers	Şimşek	2020
MA	The efficiency of mobile assisted language learning (MALL) in vocabulary learning	Atay	2020
MA	Exploring the predictive power of in-service EFL instructors' informal technology usage situations on their TPACK levels	Dinçer	2020
MA	An action research: EFL students' perceptions and motivations towards flipped classroom and Web 2.0 technology	Girgin	2020
MA	Exploring the predictive power of in-service efl instructors' informal technology usage situations on their tpack levels	Yıldız	2020
MA	The effect of Web 2.0 tools on Turkish EFL students' peer review types, attitude and writing performance	Guksu	2020
MA	Exploring in-service English Teachers' beliefs about using Web 2.0 tools and telecollaboration in language teaching and learning process	Yücel	2020
MA	An investigation into using Kahoot! for grammar practice from learners' and instructors' perspectives	Puğ	2020
MA	Using Educational Informatics Network (EBA) as an educational learning platform in EFL courses in Turkey	Kurnaz	2020
MA	University students' perceptions of mobile assisted language learning	Harbelioğlu	2020
MA	The use of video materials in EFL learners' reading comprehension	Ekinci	2020
MA	The effects of using Quizlet on vocabulary enhancement of tertiary level ESP learners	Arslan	2020
MA	An exploration of English as a Foreign Language (EFL) teachers' perceptions on 21st century learning and innovation skills	Kaçar	2020
MA	The effects of TED talks as extensive listening in Turkish EFL context	Çelik	2020
MA	An investigation into EFL teachers' self-efficacy beliefs, frequency of use and attitudes towards Web 2.0 tools	Yaprak	2020
MA	The effects of blogging on enhancement of L2 learners' writing skills at preparatory class level	İşçi	2020
MA	The role of English subtitles in English movies on EFL learners' content and vocabulary comprehension	Çağlar	2020
MA	The use of EBA (Education Information Network) in teaching vocabulary and grammar to efl young learners	Pehlivan	2020
MA	The effect of songs on pronunciation of young EFL learners	Saldıraner	2020
MA	Effects of strategies-based instruction through Randall's Cyber Listening Lab and Quizizz on EFL students' listening comprehension and strategy use	Şan	2020
PhD	A case study on the implemantation of distance EFL education	Tur	2020
MA	Effect of flipped instruction in grammar teaching in English as a foreign language class (EFL)	Yavuz	2020
MA	A qualitative study on instructors' attitudes, readiness, and challenges toward flipped teaching in preparatory schools	Yılmaz	2020

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