Digital content in graduate level in Turkey: A content analysis of twenty years

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ABSTRACT

The aim of this study is to examine graduate level theses that focus on digital content and completed between 1989 and 2019 in Turkey. Examination of the theses with the specified categories will show us their purpose and scope and which result has been achieved. We believe that this study will shed light on researchers to show how the trends emerged in terms of educational digital content. In order to identify the theses, the Dissertation Database of Turkish Council of Higher Education was searched by using digital content, digital material, digital story, and animation as keywords. As a result of the search, 150 studies were identified. Among them, 15 studies were dropped out due to their irrelevance, which left 135 theses for evaluation. For data analysis, descriptive content analysis method and categorical analysis technique were employed. The theses were reviewed based on publication year, institute, university type, subject, research method, research design, participants, data collection tools, and target audience. The descriptive results were provided in tables. Theses on digital content started to gain intensity mainly in 2000s and these studies were mostly carried out in the field of engineering and fine arts. After 2010, more research with the focus on digital content and animations was conducted in the field of education. The results revealed that most of them completed for master's programs at the educational sciences institutes between 2013 and 2019. In the field of Turkish education, similar studies, specifically on digital stories, were conducted after 2015. As a result, this study sheds light on graduate students in terms of the gap in the literature regarding digital content.

Keywords: Digital materials, digital story, animation, digital content.

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INTRODUCTION

Throughout history, every society and every generation have been more exposed to different technologies than its predecessors. In this century, the speed of access to information is the main theme that will define the information society's structure. Despite the fact that people have more or less access to information in the past, the distinguishing factor between the past and the present is the inequality and the lost time in access to the broad masses of information. The digital age has eliminated this inequality and slowness with what it has brought people.

The technological adventure, which started with the industrial revolution and reached its peak with the discovery of the internet in the 90s, brought a different social structure to life. Today's generation, unlike the previous generations, is an information society with different needs and interests. Information society refers to the society structure in which the production and transmission of information becomes widespread, knowledge is accepted as a capital and power, and access to information and learning is an essential element of life (Çetin, 2010). Considering that the use of technology has increased intensely in all areas of life, technological opportunities are also utilized, for instance, to influence people and find customers in many fields, especially in economy and politics (Akın, 2015). In this

context, education is also another field that should not stay away from these opportunities. As a dominant factor to direct societies, education strives to respond to people's needs by using all digital elements. Here, the key word is *need* and in order to define it, it is critical to understand this generation, called as digital natives by Prensky (2001), and their expectations.

The concept of generation describes the sum of people who were born in similar years, suffered from similar troubles, were exposed to similar living conditions of Kırık and Köyüstü (2018), and have similar reflexes. There are certain definitions and outlines of generations in people's minds and they emerged with the generation's perspectives, expectations (Altunbay and Bıçak, 2018), and their reactions to the events and situations they experienced. Having the same characteristics of the students in the same generation facilitates the recognition of the students, and this ensures that the education and training activities are designed according to them (Altunbay and Bıçak, 2018). In the literature, people born after 2000 are considered as the z generation. In short, it is critical to know more about the z generation in order for all educational processes to succeed.

For this generation, technology is a standard element of life and is at the center of their lives. Considering that this generation uses mass media effectively and accesses information quickly and speedy (Kırık and Köyüstü, 2018), the importance of transferring information and meeting the expectations of the z generation once again emerges.

Contrary to previous generations and in accordance with the new educational paradigm, today's students take an active role in the learning process and acquire knowledge in different ways. In fact, internet access with existing technology and technological tools has moved the student to a position that serves the constructivist teaching process, where the student is in the center and is active from the passive state in the learning process, and can interfere with the process. Students of the digital age have a desire to learn through materials containing pictures and videos while pushing the written materials to the background (Türel, 2019). Technological devices also offer different opportunities for these students with different individual characteristics and learning styles (Türel, 2019). With these, today's students may continuously renew their knowledge, determine their learning preferences, and analyze and develop critical thinking skills. In addition, learners of the digital age have a number of special expectations and skills from their digitalized lives. For instance, learners now prefer to experience trial and error rather than just hearing it. Today, individuals can access various solutions for any action they cannot do or any problem they cannot solve by using the internet. Therefore, rather than knowing, having the skills of accessing information and integrating the information to make it available becomes prominent (Türel, 2019).

The digital world also requires teachers to change. The new generation of teachers is not just a source of knowledge, but they need to serve students guidance to access to information, be open to learning, teach learning, and design activities and teaching materials. In fact, teachers are expected to have pedagogical knowledge and technological competence to address the needs of the students they are dealing with (Yaman et al., 2013).

Another reflection of the developments and changes in the learning process is the reorganization of the learning environments. Adaptation of technology to educational environments brings a great richness to teaching environments while being a motivating factor for both teachers and students in the teaching and learning process (Ciğerci and Gültekin, 2019). Equipping learning environments with technological tools that attract students and meet their needs provides more effective learning. A multimedia system that includes text, graphics, sound, animation, and/or video, significantly increases learning and understanding since it provides multisensory experiences to the learners (Çakmak, 1999; Türel, 2019). They have a facilitating structure that saves students from the boredom of a steady lesson, allows them to easily understand a topic that is not understood for a long time, and saves time for people (Akın and Çeçen, 2015). However, considering the changes in teachers' and student' roles and learning environments, any mistakes in integration of technology into education may cause wasted labor, time and money (Türel, 2019).

After all these technological developments, the change has become an imperative for educational institutions. The first examples of this change began to appear in the 2005-2006 academic year in Turkey. A new learning area has been added to the curriculum under the name of visual reading and visual presentation and their acquisitions were added to the other areas in 6th, 7th and 8th grades. Visual reading refers to reading, understanding and interpreting of shapes, symbols, pictures, graphs, tables, body language, science and social events, mass media, and information technologies (Erkunt and Akpınar, 2002). Visual presentation, on the other hand, refers to sharing visual reading with other people.

In the following years, Turkey Ministry of National Education has made many implementations in terms of technology compatibility. One of the most important implementations was the Fatih Project launched in 2010. The intense usage of the Internet eliminated physical imperative in learning environments and revealed an internet-based learning. To this end, with the Fatih Project, students had access to course materials in and out of school and start sharing about course contents (Maden and Önal, 2018). For this purpose, a multi-purpose copy machine was provided to all schools, an internet infrastructure was created for each school, either wired or wireless internet was provided to all classes, and interactive boards were installed in classrooms. In addition, all teachers and students were provided tablet

computers in order to access to the related network, the interactive board, and the course contents. In line with the Fatih Project (MEB, 2020), the Educational Information Network (EIN) platform was served to all students and teachers in 2012. The purpose of EIN is to support effective material use by using information technology tools at schools, at home or wherever needed and to integrate technology into education. Today, EIN continues to deliver reliable and accurate e-contents that are appropriate for each grade level (EBA, 2020). Technological advances have also revealed placeless and timeless educational environments instead of standard educational environments.

E-learning, which is the form of distance education via electronic media (Hakkari et al., 2009), allows learning to take place wherever there is an internet connection regardless of a certain classroom environment and limited time and allows education to be reached to a large audience. Also e-learning provides the advantage of conformity to the learning speed of the student, rapid access, and learning at the desired intensity and enables students to self-control their learning.

Technology integration in education is also significantly related to the content and applications (Yılmaz et al., 2017). Digital literacy, which is the prominent concept for the receiver in understanding this content, is the ability to use and understand the information provided through computers in different ways from large sources (Gilster, 1997). E-learning should not be considered as simply transferring books or various information to electronic media. Content should be up-to-date, appropriate for learning environments and students' levels, and student-centered. Also, it should increase students' motivation, attract attention, and be easy to use (Hakkari et al., 2009). E-content is expressed as digital resources that can be used in all learning environments and can be developed through information technologies by using text, audio, video, animation, and/or image (Kollias, 2007). Digital stories are one of those contents that are frequently used in educational environments. Although story was defined as combination of text, video, image, sound, and music together in a computer environment (Chung, 2007), digital story is actually the use of multimedia tools including text, sound, music, video, animation in a certain relationship. In this sense, digital stories may be used in different fields such as medicine, social services, museums, psychology, history, community participation, and youth projects (Karoğlu, 2015). Through digital story applications, real life applications and the learning environment in the classroom can be combined in a balance (Karoğlu, 2015). While effective use of digital stories strengthens cooperative learning, it encourages students to develop literacy and critical thinking skills (Yılmaz et al, 2017). Also, it requires individuals to direct, practice, think, and interpret while creating and transferring their scenarios into electronic format (Karoğlu, 2015).

Stories, which have been an important material in language teaching for centuries and which are one of the oral and written cultural products of Turkish, have taken their place in the digital world with developing communication technologies (Kurudayıoğlu and Bal, 2014). Active use of technological tools in the Turkish lessons, whose main objective is to provide basic language skills, is the most important contribution in this regard. The combination of visual and audio elements in digital stories will contribute not only to speaking, writing, and visual presentation skills but also to listening, reading, and visual reading skills.

Animation is another tool that is frequently used in educational environments. It is defined in the Turkish dictionary as the task of organizing and transferring individual images or still objects in a way that can give a sense of movement during demonstration (TDK, Current Dictionary). A similar description is provided by Türel (2019) as well. Although some students have knowledge about any subject, they cannot make the concepts related to the subject tangible in their minds and, therefore, there might be misconceptions and incomplete learning. Animations enable students to review the theoretically taught information in the mind in a unity (Yakışan et al., 2013). The attraction provided by the visual elements of the animations allows them to be used easily in many courses.

Statement of the problem

Technology is at the center of today's students' lives and they meet most of their needs through digital tools and the Internet. Students benefit from these technological tools to support their learning. Today's learners prefer materials that are dominant in terms of visual elements and put written materials to the background in their preferences. They are active in the learning process, can interfere with the process, and prefer to experience. Therefore, designing digital content appropriate for learning has become a necessity in order to support students' needs for learning. In parallel with this change in students, the teachers are expected to have technological competence, design instructional materials and activities, and, in short, keep up with the process. There is a need to identify studies in this topic, evaluate them, figure out the trend in the field of digital content, and shed a light to researchers in the field.

Importance of the study

Recently, in and out-of-school learning environments have been enriched through digital content, which attracts researchers attention. For this reason, topics including the effects of digital content on students' learning, frequency of use, ways to implement them are studied. With this particular study, it is aimed to reveal the big picture about the studies conducted on digital content

in all fields as well as the field of Turkish education by examining graduate theses through content analysis.

Aim of the study

The aim of this study is to examine theses conducted in Turkey on digital content in a holistic way and to find out the trends in theses on digital content completed in the major of Turkish education. Therefore, the study addressed the following research questions:

1. What is the distribution of the theses according to their types?
2. What is the distribution of the theses according to their publication years?
3. What is the distribution of the theses according to their institutions?
4. What is the distribution of the theses by university types?
5. What is the distribution of the theses according to their subjects?
6. What is the distribution of the theses according to the research methods?
7. What is the distribution of the theses according to their research designs?
8. What is the distribution of the theses according to the number of samples?
9. What is the distribution of the theses according to the data collection tools?
10. What is the distribution of the theses according to the target audience?

MATERIALS AND METHODS

In this section, research model, data sources, data collection method, and data analysis are explained.

Research model

This study was employed a qualitative research method. Qualitative research is defined as a research in which qualitative data collection methods including observation, interview, and document analysis are employed and a qualitative process is pursued to reveal perceptions and events in a realistic and holistic manner in a natural environment (Yıldırım and Şimşek; 2005). Document analysis was conducted in this study. It involves the analysis of written materials that contain information about the facts and cases intended to be investigated (Yıldırım and Şimşek, 2005).

Data sources

The documents evaluated in this study consist of 150

theses focused on digital content in the field of education and accessible in the Dissertation Database of Turkish Council of Higher Education between the years of 1989 and 2019. The keywords, title, summary, and index information were taken into account and a total of 150 education-related theses with open access were chosen. These theses were also examined in terms of their purposes. Among them, 15 theses were dropped out from the analysis due to their irrelevance to education and their type (e.g., historical or introduction), which left 135 theses. In the mixed research design studies, the research design and data collection tools are considered separately.

Data collection

Within the scope of this study, the digital content-related thesis analysis form was prepared. The form included the following items: publication year, institute, university type, subject, research method, research design, number of participants, data collection tools and target audience. As the theses were reviewed, the form is finalized by adding new items.

The inclusion criteria for theses listed under the Dissertation Database of Turkish Council of Higher Education were identified as followings: (a) he deadline for the studies included in was set as January 15, 2020, (b) The target group was limited to Turkey, (c) digital content, digital material, digital story, and animation were used as keywords, (d) a list of keywords were identified by the researchers and then two experts reviewed the list and finalize the keywords. The identified keywords including digital content, digital material, digital story, and animation were used in Turkish and English for identification of theses, (e) the data was collected from theses identified based on the inclusion criteria listed above.

Data analysis

In the analysis of data, descriptive content analysis method and categorical analysis technique, two of the content analysis methods, were adopted. The data is subjected to a deeper processing in content analysis and it enables researchers to reach the concepts and relationships that explain the collected data. Through content analysis, data is organized within the framework of certain concepts and themes and interpreted in a way that readers can understand (Yıldırım and Şimşek, 2005). In categorical analysis, data is divided into units according to criteria determined previously or added during the examination (Tavşancıl and Aslan, 2001).

In the study, the theses were identified in terms of the inclusion criteria. The categorical analysis was completed based on the statements authors stated in the theses. Frequencies (f) and percentages (%) were calculated. In

terms of validity and reliability, (a) data collection and analysis processes were explained in details, (b) the digital content-related thesis analysis form was designed, and (c) consistency among the researchers and an independent coder was calculated based on Miles and Huberman's formula (1994) (Reliability = Consensus / (Consensus + Disagreement)). The reliability coefficient was calculated as 0.90.

FINDINGS

Findings related to the sub-objectives of the study are presented in tables below.

Findings related to the first sub-objective

As seen in Table 1, among 135 theses, almost 70% of them were master's thesis, which was followed by doctoral thesis and proficiency in art thesis. The reason may be that there are more master's programs than other programs in Turkey.

Findings related to the second sub-objective

According to the data provided in Table 2, 82 theses are completed in the field of educational sciences, which was followed by theses in the field of natural and applied science (n = 33) and social sciences (n = 20). Despite of this finding and considering the findings provided in Table 5, it may be possible to consider the theses completed under the fields of natural and applied science and educational science together.

Findings related to the third sub-objective

As seen from Table 3, there is only one thesis completed until 2005. Between 2006 and 2012, 32 theses were completed, this amount increased to 102 in the following time period. This may be interpreted that digital content as a research topic attracted graduate students more comparing with the previous years.

Findings related to the fourth sub-objective

According to the findings provided in Table 4, among 135 theses, 128 of them completed in state universities.

Findings related to the fifth sub-objective

Table 5 reveals that most of the theses are completed in the field of science. Of these, science education programs take the first place with 47 theses, which was followed by the department of computer education and

Table 1. Distribution of theses by types.

Type	f	%
Master's thesis	93	68.8
Doctoral thesis	40	29.6
Proficiency in art thesis	2	1.4
Total	135	100

Table 2. Distribution of theses according to institutes.

Institute	f	%
Social Sciences	20	14.8
Educational Sciences	82	60.7
Natural and Applied Science	33	24.4
Total	135	100

Table 3. Distribution of theses by year.

Publication year	f	%
1989-2005	1	0.7
2006-2012	32	23.7
2013-2019	102	75.5
Total	135	100

Table 4. Distribution of theses according to university types.

Type	f	%
State	128	94.8
Private	7	5.1
Total	135	100

instructional technologies with 25 theses. Although Turkish education is in the third place, the number of completed theses can be described as relatively few.

In the field of science, it is known that experimental studies are abstract, difficult to try, and costly. Therefore, those studies may be completed in digital environments which are independent of the physical environment and cheaper, which may explain why science education programs took the first place in the table. The second place was reserved by the Department of computer education and instructional technologies due to the necessity of working with digital content in this field.

Findings related to the sixth sub-objective

According to Table 6, the studies were carried out mainly by employing quantitative research method. It is noteworthy that 29 of the studies conducted with the mixed research method were completed after 2015.

Table 5. Distribution of theses by undergraduate programs on education.

Undergraduate programs on education	f	%
Computer science and instructional technologies	25	18.5
Science teacher education	47	34.8
Biology	3	2.2
Geography	2	1.4
Foreign languages	7	5.1
Educational programs	1	0.7
Physics	5	3.7
Graphics education	2	1.4
Chemistry	6	4.4
Mathematics	5	3.7
Music teaching	2	1.4
Early Childhood education	4	2.9
Fine arts education	2	1.4
Elementary school education	9	5.9
Social sciences education	3	2.2
History education	1	0.7
Turkish education	11	8.1
Total	135	100

Table 6. Distribution of theses according to research methods.

Research method	f	%
Quantitative	71	52.5
Qualitative	23	17.03
Mixed	41	30.3
Total	135	100

Among 135 theses, 23 were conducted according to the qualitative research method. The number of quantitative studies is higher than the numbers of qualitative and mixed studies as a result of the relatively easy execution of this research method.

Table 7. Distribution of theses according to research design.

Research design	f	%
Experimental	63	45.6
Semi-experimental	35	25.3
Case study	12	8.6
Action research	9	6.5
Embedded research	8	5.7
Documents	3	2.1
Scanning	4	2.8
Literature review	2	1.4
Phenomenology	2	1.4
Total	138	100

Table 8. Distribution of theses by data collection tools.

Data collection tools	f	%
Observation	14	6.6
Interview	43	20.4
Scale	71	33.8
Achievement tests	70	33.2
Document analysis	4	1.9
Survey	8	3.8
Total	210	100

Findings related to the seventh sub-objective

According to Table 7, the experimental research design was mostly preferred research design, which was followed by semi-experimental, case study, and action research design methods. The least preferred patterns are literature review and case studies.

Findings related to the eighth first sub-objective

According to Table 8, scales and achievement tests were preferred the most. In experimental studies, the effect was measured mainly through scales and achievement tests. In addition, it was determined that interview and observation forms were used more than document analysis and surveys as data collection tools.

Findings related to the ninth sub-objective

According to the number of participants, studies mainly included up to 100 participants. Relatively low number of studies included 101-150 participants (n = 17) (Table 9).

Table 9. Distribution of theses according to the number of participants.

Number of participants	f	%
0-50	51	37.7
51-100	53	39.2
101-150	17	12.5
151-200	4	2.9
201<	10	7.4
Total	135	100

Table 10. Distribution of theses by target group.

Target group	f	%
Early childhood	4	2.9
Elementary	19	14.07
Middle school	63	46.6
Primary education	8	5.9
High school	16	11.8
University	25	18.5
Total	135	100

Findings related to the tenth sub-objective

According to the target audience of the theses, it was found that studies were carried out intensely at the middle school level (n = 63), which was followed by university students (n = 25) (Table 10). Another important finding is that digital content-related theses were not preferred to be conducted in early childhood and primary education levels.

DISCUSSION AND CONCLUSION

This study examined 135 theses on digital content, digital material, animation, or digital story and it is found that those who sought doctorate education or proficiency in art in Turkey tend to work less on digital content. This may be result in a lack of interest in digital content, an increase in the number of people who seek to pursue a master's degree, and an anxiety in people due to various positions in different institutions that require a master's degree. A similar result was obtained by Özçakmak (2017). He examined theses completed in the major of Turkish education between 2011 and 2015 and found that 81.3% of them were completed in master programs. Another finding of the study is that the studies were conducted mostly in the institute of educational sciences. Although the science institute seems to be in the second place following the educational sciences institute, it would be more appropriate to consider two institutes together since the studies in the field of science education are in the first place in the distribution of theses based on their major. Another critical finding is that among the theses, only one doctoral thesis was related to digital content. This is an indication that, like many other fields, there is a gap in theses on digital content, which needs to be filled out in social sciences as well as in other fields. Also, in social sciences, there were a total of twelve theses since 2016. These results imply that studies in the graduate level related to digital content, which proves that the trend towards digital studies in this field has increased relatively.

Findings about the distribution of theses by years indicate that the studies on digital content started in 2005. The fact that only one study was carried out before 2005

is remarkable in terms of showing that there is a delay in the studies related to digital content. Specifically, considering the intensity observed in digital content studies especially after 2013, doctorate theses after 2013 correspond to approximately one fifth of the master's theses.

The classification according to the education-related undergraduate programs shows that the studies were conducted in the science education department. The reason might be that in the science education departments, where experimental studies are mainly preferred, the subjects that are abstract, difficult to try, and expensive are possible to conduct through digital content. Also, in terms of the capacity of academic staff who are interested in postgraduate studies related to education, academicians are quantitatively older and larger in number than in other teacher education programs. Moreover, the fact that teaching technology is a part of science education may be another reason for more studies on digital content in the field of science education. Following this, theses completed in the department of computer education and instructional technologies show that this field, which is compulsory to work with digital tools, also chooses related content. A limited number of theses related to digital content in other fields shows that many fields still cannot adapt to the developing technology and its tools, except for necessity.

The distribution of the studies according to the research methods is in favor of quantitative studies and more than half of them were completed in the field of science. This might be due to that quantitative research methods have been used for years in the fields of educational science, natural and applied science, and social science as a traditional research method (Yıldırım, 1999). In addition, quantitative studies and research methods are mainly preferred in the field of education similar to the field of science. Specifically, since the emergence of educational sciences as a sub-field of science, researchers in the field of education have benefited from their research methods, which provide reliable and valid results (Yıldırım, 1999). In addition, while the number of samples in the theses evaluated in this study is mainly below 100, 38 percent of the theses included less than 50 participants. In terms of research model, while the number of samples was generally below 50 for qualitative

studies, it ranged from 50 to 100 in quantitative studies. This might be due to experimental and semi-experimental research designs that include control groups. Another critical finding is related to the target group of the theses. Although digital content, digital material, animation or digital story are appropriate learning materials for all age groups, it was observed that the theses mainly included students in primary and middle schools. This implies that more research is needed to include other age groups as well as primary- and middle school-age groups.

When the findings are examined in terms of Turkish education, it is concluded that the studies on digital content are below 10% with only 11 theses, which implies that the interest in digital content is insufficient in Turkish education as well. Almost all of those studies were completed after 2015, which is due to the inclusion of technology in schools and learning environments. Specifically, Özçakmak (2017) determined that the studies on Turkish education in recent years have increased by one and a half times. Similarly, Varışoğlu et al. (2013) accepted the increasing trend of the studies in the field of Turkish education as an indication of the acceptance of Turkish education as a field in science. Although studies in the field of Turkish education tend to increase, the findings of this study show that the studies related to digital content are limited to 11 theses considering all studies in Turkish education, which means that the studies on digital content in the field of Turkish education are inadequate.

SUGGESTİONS

According to the results of the sub-problems of the research, the following suggestions were provided:

It is suggested that studies on digital content should be emphasized at doctorate level compared to master theses. The vast majority of educational studies related to digital content were based on experimental studies and the effects of the approaches used in digital content in these studies were measured. However, more qualitative studies need to be conducted in order to carry out in-depth analysis, especially in the search for why and how questions. Apart from the field of science education and computer education and instructional technologies and especially in Turkish education, it is necessary to focus more on experimental studies within the context of digital content. Research on basic skills in Turkish education should also be studied in digital environment. Moreover, the scope of the target audience should be expanded and searched in terms of both teacher education and secondary education.

The number of samples should be diversified according to research problems related to digital content. Considering that digital content goes beyond being a technical subject, it seems that it addresses the needs of the entire teacher education programs. In this respect, it

is expected that studies on digital content will be included more in the undergraduate programs.

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