CURRENT TRENDS IN COMPUTER AND INSTRUCTIONAL TECHNOLOGIES EDUCATION (CEIT) MsC AND PhD THESIS IN TURKEY (2005-2014)

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Abstract

In our age in which scientific and technological development is faster than ever, an increase of innovations and current needs without restraint; unavoidably push us into this velocity and the search for novelty. İn order to keep up with these developments, and seize the technology, education has undoubted roles. Especially the field of educational technologies undertakes substantial duties in this assignment. The aim of this study which grounds on the survey of postgraduate and doctoral dissertations in the field of educational technologies released between 2005 and 2014; is to show us the point we reached and the target we can approach in educational technologies. The dissertations taken into the research were examined according to their keywords, research method, data acquisition means, data analysis techniques, and the group studied on. The research aimed at approaching the whole target population of the study. However, because some of the dissertations were limited in publishing and usage; a number of postgraduate thesis sampled was 402, and doctoral dissertation number was 85. In this thesis in which document review technique was used, the dissertations reached via HEC (Higher Education Council) database, were gathered in detail according to the aim; transferred to MS Excel tables, qualified according to their years and types by means of SPSS 15.0 software. Frequency analysis and descriptive analysis were carried out, and they were categorized and tendency graphics were created. Analysis of the dissertations via the content analysis and tendency analysis techniques was aimed at making a contribution to the scientific field.

Key words: *Educational technologies, current tendencies in educational technologies, tendencies in postgraduate and doctoral dissertations*.

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1. Introduction

Parallel to the technological developments, the significance of knowledge is rapidly increasing today, and in the era, we live in, the phenomenon of change gains momentum with each passing day. Particularly the changes in information and communication technologies have made the world smaller through globalization while making the information databases bigger[1].

Individuals are becoming able to use the information and technology as it develops, and this fact will make positive contributions to both their personal growth and society. This future can only be made possible by giving sufficient importance to the educational technologies. Educational technology, the accelerating trend of the recent years, is an amalgamation of all methodologies and techniques created for the application of educational principles. Educational technology also includes all sorts of systems, techniques and assistance that created in order to improve the learning process. The intensive use of the information technologies in all the areas of society has created a need for qualified individuals in the information society. In order to fulfil this need by way of training qualified individuals, modern education departments have been established, existing ones have been improved and the education system has been synchronized with the new technology [2]. The teachers of the Department of Computer Education and Instructional Technology have an important role in education and technology.

The main purpose of this study is to provide a general view of the characteristics (i.e. writer, university, thesis advisor and publication year) of the theses prepared in the Departments of CEIT, keywords, research methods, data gathering tools, data analysis techniques and the study groups ; and acquire knowledge about the current situation of the country by way of doing so.

2. Literature

When we examine the literature, we can see that the studies on some topics have begun; these topics are, how to teach information technologies to the children and adolescents, how to integrate the common technologies with the education process of different classes, how to teach information technology skills to teacher candidates more efficiently and how to use the technology in educational and administrative works [3]. The computers, computer technologies and education-related studies - which are the foundations of information technologies - are the significant components of these studies. In many countries and particularly in the USA, one of the purposes of the academic studies that had been conducted was to understand the tendencies of these countries. The methodological analysis of these studies that have been carried out in the field of educational technologies dates back to the 1956s. If we were to examine the previous studies, we would find out that there aren't many examples. John Moldstad conducted the first content analysis on the doctoral theses written in the field of educational technology, and it was updated and published in four different issues of the Audio-Visual Communication Review between 1956 and 1961. It is known that the oldest doctoral thesis in Moldstad's compilation (1956) was completed in 1921 [4]. After Moldstad, Che-Tsao Huang took over; in addition to the previous studies, he analyzed the content of the doctoral theses written between 1960-70 and studied the theses of Kirschner, Mapes and Anderton (1975) written between 1969-1972. Caffarella and Sachs (1988) began with studying the doctoral theses written between 1977-1986. Caffarella (1991) examined the theses written in 1987-88, and Caffarella (2000) put forward the assessment of 2689 theses written between 1977-1998. Caffarella updated them through the years and gathered all the doctoral theses, written between 1977-2006, in the Cortland University library. A similar study was carried out by Donald P. Ely (1992). Ely conducted a content analysis by studying the postgraduate theses from 5 different American universities on the topical trends of educational technologies between 1988 and 1991[5]. In this case, it is safe to assume that all of the doctoral theses written in the USA from 1921 to 2006 have been compiled

and their contents have been analyzed [6,7]. In 2007 Hew, Kale and Kim examined 3 issues of the journal and tried to ascertain the point to which the educational technology had reached regarding the topics and method and research sample. By analyzing 340 papers, they addressed the many common topics of 2000 and 2004, such as media study and psychology of learning. These kinds of great efforts generally have been made in higher education studies [8].

Similar studies have been carried out in Turkey. A study named "Current Tendencies in Educational Technology Studies in Turkey" was carried out by Simsek et al. (2008) and the current tendencies of the time were determined by reaching a total of 64 doctoral theses written in the field of educational technologies in the last decade in our country [9]. In another study, Simsek et al. (2009) examined 259 post graduate theses done in the field of educational technology in our country between 2000-2007 [10]. With their study on the papers published in The Turkish Online Journal of Educational Technology (TOJET) between 2003-2007, Alper and Gulbahar (2009) reached a similar conclusion as that of Simsek et. al (2008) did [11]. In their other studies regarding the tendencies of educational technologies, Alper and Gulbahar (2009) examined the papers published in the last three years in Turkey, and as a consequence, they emphasized that, parallel to their previous studies, e-learning and distance education were the most researched topics; however, patterns of descriptive literature review were also observed in the papers [11]. Our findings show that similar to Alper and Gulbahar's (2009) studies, the tendency towards the topics of e-learning and distance education has increased. This situation shows that the topics of e-learning and distance education are still considerably relevant. One of the studies carried out in the field of educational technology in Turkey is Erdogmus and Cagiltay's (2009) analysis on the theses published by the universities with the masters and doctoral programs in the department of computer education and educational technology. In the study called "Research Tendencies Observed in the Postgraduate and Doctoral Theses in the Field of CEIT in Turkey: A Document Analysis", which was prepared as a postgraduate thesis, 215 postgraduate theses and 32 doctoral theses written in Turkey had been examined and had extensively been discussed regarding the topical trends [12]. After examining the postgraduate theses written in the field, Akca Ustundag (2009) emphasized in her postgraduate thesis that while the interest in distance education had been increasing, the interest in computer-assisted instruction had been decreasing [13]. Sert (2010) examined 173 papers - whose target readers were chosen from Turkey - by conducting content analysis; the essays were indexed in Social Science Citation Index (SSCI) and published in Turkey between 1989-2009. According to the result of the study, the most researched topic was 'learning outcomes' [14]. At the same time, with their study named "Tendencies Observed in Educational Technology Researches in Turkey: Content Analysis of the 2000-2009 Papers", Goktas et al. (2012) intended to reveal the descriptive characteristics, methodological aspects and general tendencies observed in the educational technologies researches carried out in Turkey. The researchers were published between 2000-2009 in international journals as part of SSCI 2010 [15].

In Turkey, there are many completed postgraduate and doctoral theses written in the field of educational technologies. All of the studies that have been carried out aimed to reveal the situation of its country, develop relevant projects and make suggestions.

3. Method

This study has been structured by using qualitative research methods and techniques. Document analysis has been used as the data gathering method. As the first step of the analysis, the postgraduate and doctoral theses, which are among the determined sample group, were obtained from the CoHE Thesis Center. Chosen theses had been saved on a computer from the CoHE Thesis Centers' website in the pdf format. After the necessary coding and analysis, they had been transferred to the MS Excel program.

The data obtained from the documents were subjected to content analysis. Then the data were arranged, grouped according to the topics and, if appropriate, revealed after being digitized. Finally, the findings were interpreted. Frequency and percentages were generally used in interpreting the data gathered from the content analysis.

Population and Sample

The theoretical universe of this research is made up of the postgraduate and doctoral theses published in the field of educational technology. However, the operable universe - determined with regard to the topicality of the research and the developments in methodology - is made up of 450 postgraduate and 107 doctoral (CoHE, 2014) theses written in the field of educational technology in the Department of Computer and Instructional Technology. The distribution of public theses by year is as follows: 2005 (η=21, 4.31%), 2006 (η=37, 7.60%), 2007 (η=43, 8.83%), 2008 (η=51, 10.47%), 2009 (η=61, 12.53%), 2010 (η=88, 18.07%), 2011 (η=67, 13.76%), 2012 (η=68, 13.96%), 2013 (η=43, 8.83%) and 2014 (η=8, 1.64%). The aim was to access the whole operable universe without resorting the sample selection during the study. However, since the publication and use of the certain theses are limited, the research was only limited to the accessible theses. As a rule, it is important to reach a sufficient number so as to provide a reliable result regarding the sample size, which is represented by η or N in studies.

4. Findings

When we examine the findings, we can see that the maximum amount of postgraduate theses was published in 2010 (n=79), while the maximum amount of doctoral theses was published in 2012 (n=15). The minimum amount of postgraduate theses is published in 2014 (n=6), and the minimum amount of doctoral theses is published in 2006 (n=1). According to the general distribution of the theses, since 2005, there has been an increase in the number of published theses.

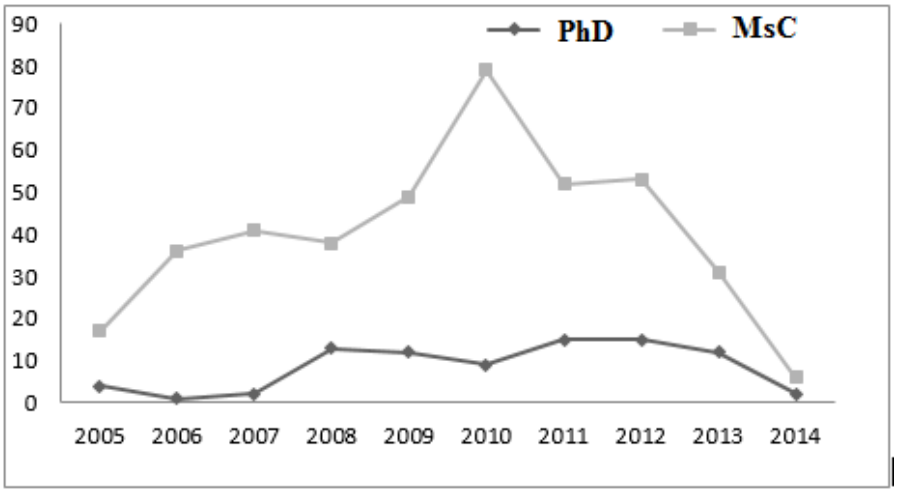

Figure 1. The tendency graph of the theses by years

The frequency tables and statistic tendencies of the classified theses were created with regard to the key words, a method of the research, data gathering methods, data analysis and study groups.

The most frequently used keywords in postgraduate theses were Computer-assisted Education (n=25), Computer-assisted Instruction (n=24) and Distance Education (n=21). The studies of Erdogmus and Cagiltay (2009), Akca Ustundag (2009) yielded similar results. Among the examined theses, 37 of them do not include keywords. We can quickly learn the topic and the scope of theses thanks to keywords and they assist us in finding theses. All these aspects considered, the absence of the keywords is a serious defect. The most frequently used keywords in the doctoral theses are Online Learning (n=6) and Vocational Development (n=5). Over the years, parallel to the research topics, the use of keywords have also diversified. The tendency of keywords used in both the postgraduate and doctoral theses are similar regarding the use of "blended learning and teacher candidates" words. As is the case of the postgraduate theses, some of the doctoral theses (n=22) do not contain keywords. This situation is an indicator that the importance of using keywords in theses has not been understood.

After the research methods of the theses were examined, they have been grouped as qualitative, quantitative, blended, meta-analysis and other methods. Among the commonly used research methods, the most commonly used in all the theses have been quantitative research and its use has gradually increased over the years. In the postgraduate research methods, quantitative research was the most frequently used method in 2005-2014 and it seems it will continue to be used more frequently in the future. In the doctoral theses, the blended (n=32) and quantitative research methods (n=26) are used more commonly.

When the theses are examined from the aspect of data analysis, descriptive statistics is more prominent. The data analysis technique used in postgraduate theses appears as t-test (n=159) trend analysis technique. Descriptive statistics (n=157) and ANOVA/ANCOVA (n=153) are among the other commonly used analysis techniques in the postgraduate theses. The trending analysis method used in doctoral theses is descriptive statistics (n=40). At the same

time, ANOVA/ANCOVA (n=39) and the t-test (n=23) are the most frequently used data analysis techniques used in the doctoral theses.

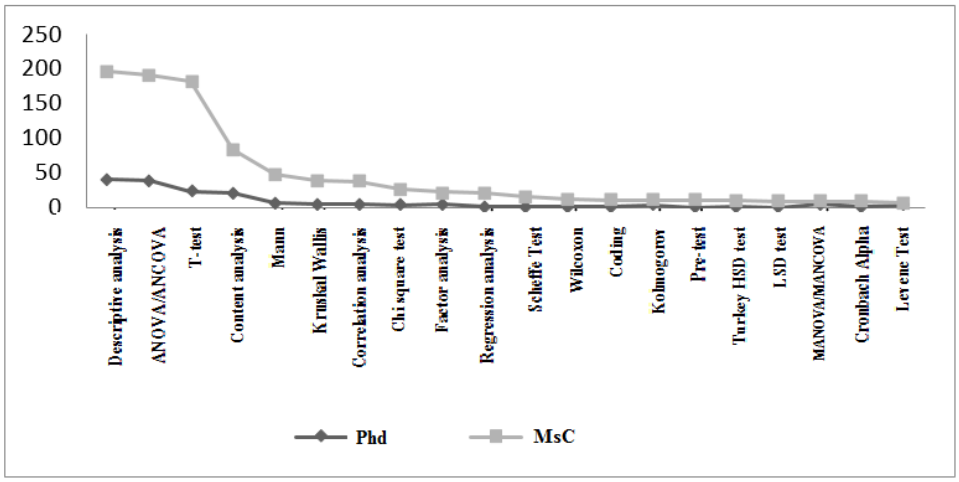

Figure 2. The tendency graph of the data analysis techniques

Regarding the data analysis techniques used in the studies, both the postgraduate and doctoral theses show similar tendencies. As shown in the table, the first five popular data analysis techniques are similar in terms of their tendencies.

Among the data gathering tools used in the study, the most preferred ones are scales, questionnaires, interviews, achievement tests and personal information forms. Even though they weren't frequently preferred in 2005, the use of questionnaires and scales has been increasing thanks to their usage and assistance in data gathering in recent years. The data gathering tools show similarities with regard to the types of postgraduate and doctoral theses. According to the results, the most trending data gathering tools are scales (n=198) and questionnaires (n=196).

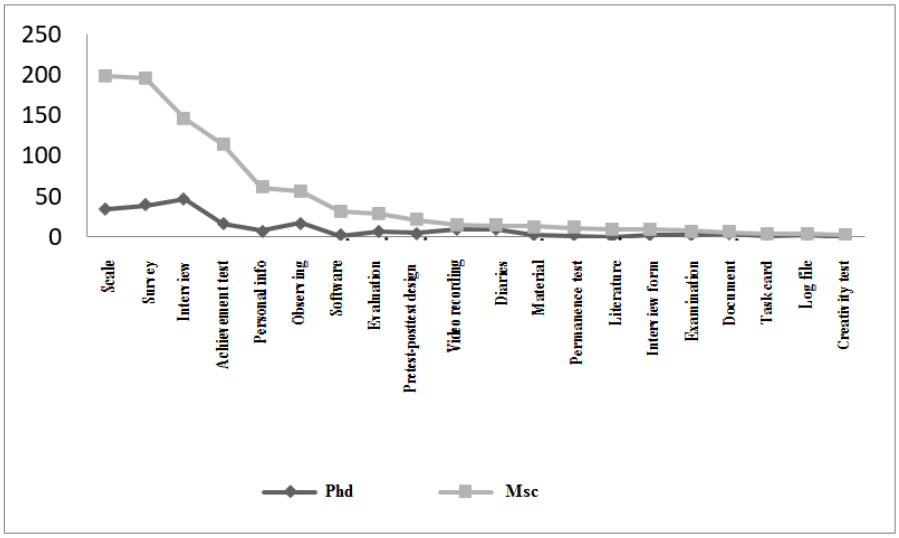

Figure 3. The tendency graph of the data gathering tools

Another topic examined in the study is the study groups. In terms of study groups, the slice consisting of 31-100 people with the rate of 41.27%, represents the maximum amount of individuals who made contributions to the study. The slice consisting of 101-300 people with the rate of 20.33% follows. The next maximum amount of people are represented by the slice consisting of 301-1000 people with the rate of %12.53. As not presented in Figure 3.6, the group which had been introduced with the rate of 3.90%, is the group that the researchers of 19 theses did not state.

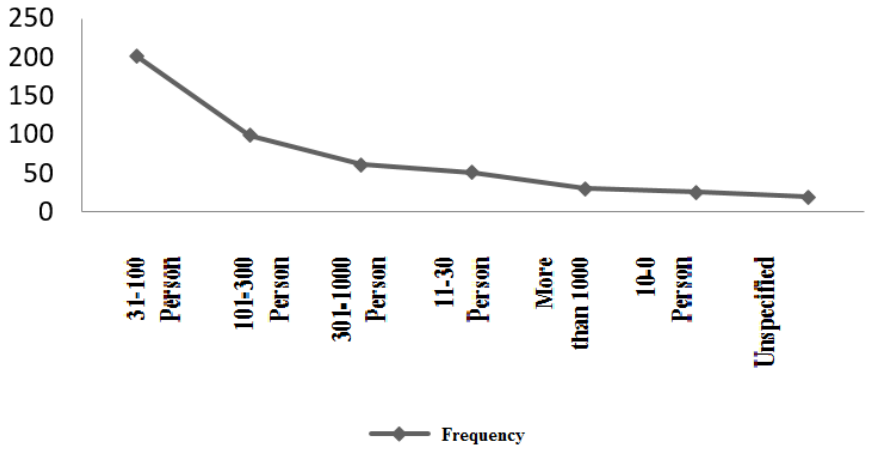

Figure 4. The tendency graph of the study groups

According to the graph, 31-100 people participated in the study for 201 theses, while 101-300 people participated in the study for 99 theses. There are 19 theses in which the number of the participants had not been stated. As it is widely known, the number of the participants of the study group is important for the reliability of the study.

In the examined theses, the majority of the participants of the study groups are the university students. The university students have been preferred as the primary study group because it is easy to do so and they're being relevant to the content of the study.

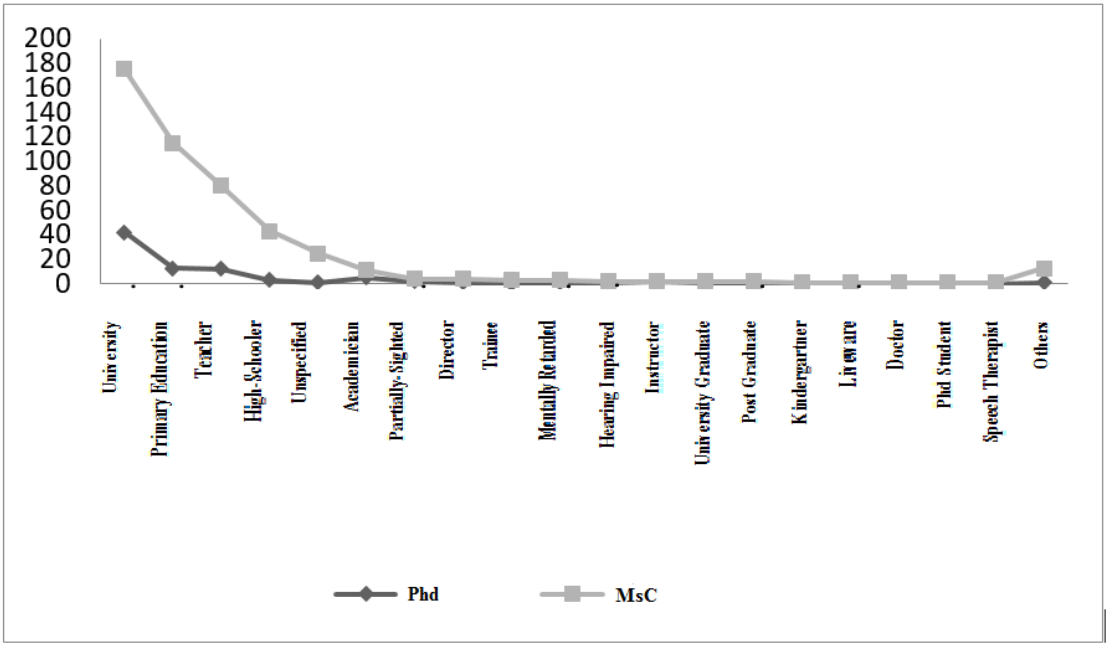

Figure 5. The tendency graph of the study groups

As shown in the tendency graph, the trending study group for both doctoral and postgraduate theses is the university students (n=175). Elementary school students (n=115) is the most trending group after the university students. The next popular study group is made up of teachers (n = 80). One of the reasons why the top rankings belong to the university and elementary students and the teachers is because there are related educators to the examined theses doing master degree and doctorate in the Department of CEIT. When the findings are evaluated in terms of years, we can predict that the trending study groups will be the primary subject groups for the future theses.

If we examine the universities that publish the maximum amount of theses; Gazi University (n=74) is in the first place, Hacettepe University (n=62) is in the second and METU (n=59) is in the third. In total, 6 universities have published doctoral theses. The maximum amount of doctoral theses were published in METU (n=42), Anadolu University (n=25) and Ankara University (n=11). For the postgraduate theses, the first place belongs to Gazi University (n=63), the second belongs to Sakarya University (n=58). The third place belongs to Hacettepe University (n=53).

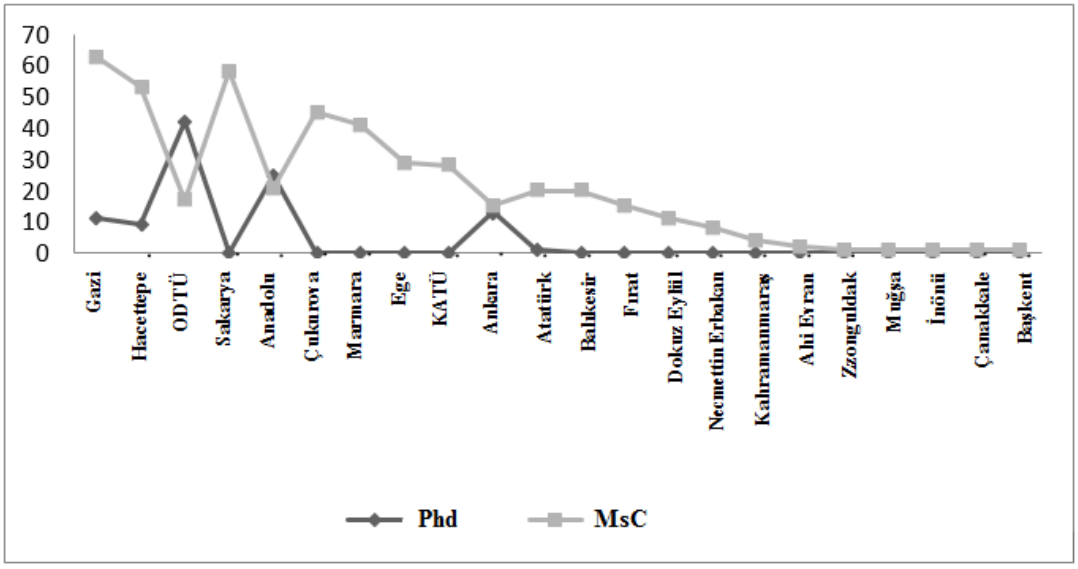

Figure 6. The tendency graph of the universities that publish theses

Among the main reasons for the tendency to go mostly toward the doctoral theses are that the doctorate take longer than the graduate study, and theses are published once in 4 years or longer.

THE CONCLUSION AND RECOMMENDATIONS

In the 21st century, technology is one of the important elements for the development of countries. In addition, societies are expected to associate science with technology, and not to make do with the abstract things but take concrete steps [17]. Besides technology and science, education appears as the third component that is being studied in theses. It is impossible to think education as a separate entity from science and technology.

It is thought that this study will help our students and teachers while choosing research topics and research projects, and gathering information. In this study, the current tendencies observed in the theses is determined by examining 487 public theses out of 556 theses published in the department of Computer Education and Instructional Technologies. Because of the limitations, the theses belonging to the years 2011, 2012, 2013 and 2014 could not be examined. At the same time, the only available theses were the ones in the CoHE system regarding the years between 2005 and 2014, the theses which did not exist in the system could not be reached. Since accessing all the theses were not possible, how the sample group represents the whole universe is based on assumptions. Among all the studies that have been carried out until now, this study is the one that involves the examination of the maximum amount of theses.

In the study, the keywords have been examined under topics such as "data gathering methods, data analysis techniques, the method of the research, the study groups, advisor, university, year and type". According to the findings, the examined topics have revealed the trending results.

The trending topics of the keywords are "computer-assisted education, computer-assisted instruction and distance education". Education and training are an inseparable whole. In the century we live in, the concept of technology supports these two concepts. In this context, the

prominent keywords are "computer usage and support". The computer usage in education and training have been increasing in the recent years. The most prominent indicator is that, governments prioritize the support for the students to use technology starting from the elementary education to higher education. The keywords of the postgraduate theses "computer-assisted education, computer-assisted instruction and distance education" have been effectively handled. However, they weren't preferred in the years 2012, 2013 and 2014. The studies on the topics "information technologies, academic achievement and teacher candidates", have continued as of 2012.

"Online learning" is one of the most frequently used keywords in the doctoral theses. As of 2011, the studies on the topics "vocational development, integration of ICT, teacher candidates and integration of technology" have continued to be carried out. The key words are more frequently used in postgraduate theses compared to the doctoral theses. The reason for this is that doctoral theses are more specific and authentic compared to postgraduate theses. The statistical study on the keywords shows what kinds of fields studies are done in the field of CEIT and what kinds of fields it is associated with.

Quantitative, qualitative, meta-analysis and blended methods have been used as research methods. Compared to the other methods, the quantitative research method was more frequently used as a trend in the postgraduate theses in 2005-2014. The researchers have mainly preferred to work on quantitative data by basing their studies on academic statistics. The qualitative and mixed methods, among the methods used in postgraduate theses, have increasingly been preferred over the years. The most prominent research method used in doctorate studies is the blended method. As has been the case with the postgraduate theses in recent years, the quantitative research method has begun to be used generally in the doctoral theses as of 2008. In the study, there are theses whose research method couldn't be determined. These kinds of theses have been put under the title of 'others' so as to be classified.

Trending data gathering tools used in the postgraduate and doctoral theses are "scales, questionnaires, interviews and achievement tests" have been preferred in all years. The usage of these tools had increased in the years between 2005 and 2015 and it is predicted that they will continue to be used to the maximum degree possible. The reason for this is that the usage and interpretation of data gathering tools are practical and open to development by the writer.

The trending data analysis technique for the postgraduate theses, published in the field of CEIT in 2005-2014, is t-test. Descriptive statistics is more frequently used in the doctoral theses. Over the years, ANOVA/ANCOVA, t-test and content analysis have increasingly been used for the data analysis.

The trending study groups for the examined postgraduate and doctoral theses are "university students, elementary students, teachers and high school students". The most studied group is "university students". The reason why mostly university students have been preferred is that they appeal to the study and they are eager to participate. Compared to the elementary and high school students, university students are more mature, single-minded and have a direct effect on the results of the study.

Among the theses that have been analyzed in-depth, there are theses whose keywords are unknown. This situation creates a limitation both for the theses which were published in this condition and the researchers that would like to use them in their academic studies. It is widely known that keywords are the most basic clues about the main subject and the content of studies.

That is why adding the keywords is one of the basic rules of writing a decent thesis, and no matter what, it should not be considered as unimportant.

Not allowing the other researchers to access one's own thesis, means limitations of sources for them. This circumstance also influences future study analyses negatively. It is evident from this study that, the trending topics of the recent years could not be discussed owing to recent theses with limitations. At the same time, most of the theses published between 2005 and 2007 remain printed in university libraries and had not been added to the CoHE thesis database. The researchers could add their previously published theses to the relevant database, and the future studies would benefit greatly from them. Moreover, enabling access to the previously inaccessible theses, would assist other researchers in conducting more reliable studies.

The repetitive information in the study has been handled as trending topics. The study specifically gives accurate information about the direction of the research tendencies. This study will both be an example and a formative study for all future studies about the topics handled in studies, methods, data gathering tools and analysis techniques and it will shed light on the formation of these studies.

As a recommendation, a study can be carried out in order to find out if theses are written with the correct statistical methods. By keeping the time frame short, other studies can be carried out on the variables. In the light of the data obtained, from where the results and tendencies - which are brought to light by learning about the opinions of academicians - are derived and why those topics are being researched can be studied. The results can be supported by comparing universities. The differences can be revealed by comparing the studies that are carried out in Turkey and abroad.

References

[1] Kılıçer, K. (2011). Bilgisayar ve Öğretim Teknolojileri Eğitimi Öğretmen Adaylarının Bireysel Yenilikçi Profilleri, Doktora Tezi, Anadolu Üniversitesi Eğitim Bilimleri Enstitüsü, Eskişehir.

[2] Kılıçer, K. ve Ferhan, O. (2006). Bilgisayar Öğretmenliği: Etik Bunun Neresinde? In 6th International Education Technology Conference Proceedings, KKTC, 19-21.

[3] Deryakulu, D. (2008). Bilişim teknolojileri öğretimi ve meslek seçimi. Bilişim teknolojileri öğretiminde sosyo-psikolojik değişkenler içinde, 125-150.

[4] Moldstad, J. (1956). Doctoral dissertations in audio-visual education. [1921-1956]. Audio-Visual Communication Review, 4(2), 291-333.

[5] Ely, D. P. (1992). Trends in Educational Technology. New York: ERIC.

[6] Caffarella, E. P. (1991). Doctoral research in instructional design and technology: A directory of dissertations 1987-1988. Washington, DC: Association for Educational Communications and Technology.

[7] Caffarella, E. P. (2000). Doctoral Dissertation Research in Educational Technology: The Themes and Trends from 1977 through 1998. Educational Media and Technology Yearbook: 2000. edited by R. M. Branch and M. A. Fitzgerald. Englewood, CO: Libraries Unlimited.

[8] Hew, K. F., Kale, U. and Nari, K., (2007). Past Research in Instructional Technology: Results of a content analysis of empirical studies published in three prominent instructional technology journals from the year 2000 through 2004. Journal of Educational Computing Research, 36(3), 269-300.

[9] Şimşek, A., Özdamar, N., Becit, G., Kılıçer, K., Akbulut, Y. ve Yıldırım, Y. (2008). Türkiye'deki eğitim teknolojisi araştırmalarında güncel eğilimler. Selçuk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 19, 439-458.

[10] Şimşek, A., Özdamar, N., Uysal, Ö., Kobak, K., Berk, C., Kılıçer, T. ve Çiğdem, H. (2009). İki binli yıllarda Türkiye'deki eğitim teknolojisi araştırmalarında gözlenen eğilimler. Kuram ve Uygulamada Eğitim Bilimleri, 9, 941-966.

[11] Alper, A. ve Gülbahar, Y. (2009). Trends and issues in educational technologies: A review of recent research in TOJET. The Turkish Online Journal of Educational Technology, 8 (2), 124-135.

[12] Erdoğmuş, F. ve Çağıltay, K. (2009, Şubat). Türkiye'de eğitim teknolojileri alanında yapılan yüksek lisans ve doktora tezlerinde genel eğilimler. Akademik Bilişim 2009 Konferansı'nda sunulan bildiri, Harran Üniversitesi, Şanlıurfa, Türkiye.

[13] Akça-Üstündağ, D. (2009). Türkiye'de bilgisayar ve öğretim teknolojileri alanında yapılan yüksek lisans tezlerinin içerik ve yöntem açısından değerlendirilmesi. Yüksek lisans tezi, Gazi Üniversitesi, Eğitim Bilimleri Enstitüsü, Ankara.

[14] Sert, G. (2010). Öğretim teknolojileri eğitiminde yayınlanmış Türkiye adresli makalelerin içerik analizi. Yüksek lisans tezi, Hacettepe Üniversitesi, Fen Bilimleri Enstitüsü, Ankara.

[15] Göktaş, Y., Arpacık, Ö., Küçük, S., Yıldırım, G., Aydemir, M., Reisoğlu, İ. ve Telli, E. Kuram ve Uygulamada Eğitim Bilimleri. Educational Sciences: Theory & Practice - 12(1). Kış/Winter. 177-199.

[16] McMillan, J. H. and Schumacher, S. (2006). Research in education: Evidence based inquiry. Boston: Brown and Company.

[17] Avcı, Ü., Kurtoglu, M. ve Seferoğlu, S. S., (2010). Türkiye'de Planlı Kalkınma ve Teknoloji Politikaları, XII. Akademik Bilişim Konferansı (AB10), Muğla Üniversitesi, Şubat, Muğla, Bildiriler Kitabı.