Evaluating Information Technology Teacher Training Undergraduate Programs in Turkey*

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ABSTRACT
The purpose of the current study was to evaluate the undergraduate program of the Computer Education and Instructional Technology (CEIT) Department. CEIT department is an undergraduate program that trains information technology teachers. The study group of the study, which was designed according to the descriptive research model, was consisted of 461 CEIT graduates, who were selected by using the convenience sampling methods. Three instruments were used to collect data; a "Personal Information Form", the "Pedagogical Competence Perception Scale for the CEIT Graduates", the "Technological Competence Perception Scale for the CEIT Graduates". The data collection tools were developed by the researchers.

When the results of the study are evaluated it is seen that the CEIT curriculum supports the participants in the acquisition of pedagogical competence more than the acquisition of the technological competence. When the pedagogical competence perceptions of the graduates are considered, it is seen that the graduates have high level competence perceptions about "Educational Planning and implementation, developing educational software and materials, educational communication competences, security and ethics in the use of information and communication technologies during the educational process, planning and implementation of the projects". When their perceptions of their technological competence are examined, it is seen that the graduates have moderate level of competence perceptions about "ability to solve problems in relation to the hardware installation and using visual software", while they have low level of competence perceptions about "ability to use system software and security of network and system".

In this study, it was understood that the undergraduate program of the CEIT department, which trains future teachers of information technologies courses, is more sufficient in terms of developing pedagogical competence and less sufficient in terms of developing technological competence in students. In this context, the contents of the courses in the CEIT undergraduate program should be updated. Additionally, some studies should be conducted in order to develop the technological competence skills of the students attending the department.
Keywords: Department of computer education and instructional technology, curriculum evaluation, competence, technological competence, pedagogical competence.

1. INTRODUCTION
In this section, the problem statement, purpose and significance of the study, research problem and sub-problems, and theoretical basis of the study are discussed.

1.1. Problem Statement
The Department of Computer Education and Instructional Technology is among the departments that were decided to be opened in 1997 with the restructuring of the faculties of education. The purpose of the department as of 1998, when it was first established, was to train Information Technology (IT) teachers, who would work in the primary and secondary education institutions affiliated to the Ministry of National Education (MoNE), would acquire basic professional knowledge and skills and would develop and teach the educational methods and techniques necessary for functional use of computers and other educational technologies.

Another goal the CEIT department was to train computer-assisted education professionals competent in the fields of designing, developing, implementing and evaluating educational materials and software (Seferoğlu, 2007). On the other hand, it has been revealed over time that it is expected from the pre-service teachers who will graduate from the CEIT department not only to support their students in acquiring computer literacy skills but also to promote the effective use of technology in the learning-teaching processes.

The first graduates of the CEIT departments in 2002 did not face any difficulty in being appointed as teachers to the public schools affiliated to the MoNE. In fact, between the years of 2003 and 2006, CEIT graduates were one of the teacher groups with the highest rate of appointment (YÖK, 2007). However, the effectiveness of IT teachers

in schools gradually decreased when IT courses were converted into elective and non-graded courses after 2007. In addition, the assumption that students come to school with basic computer skills has led to the complete removal of IT courses from primary and secondary schools. Accordingly, in recent years, it has been observed that CEIT graduates have not been appointed as IT teachers or that a very limited number of appointments have been made (MoNE, 2012). On the other hand, with the changes made in 2012, IT courses have been made mandatory again for some grades, even though the number of course hours is low (MoNE, 2012).

With the launch of the FATIH Project in 2010, CEIT graduates started to consider that IT teachers would be given important responsibilities in this process (Kurtoğlu & Seferoğlu, 2012). However, there is no study investigating the current status of CEIT graduates and also there is no change in the number of CEIT graduated appointed as teachers. It is possible to say that as the chances of being appointed as a teacher have decreased, the CEIT graduates have started to search for work areas suitable to their knowledge and skills. Research demonstrates that some students who are planning to find a job in areas other than MoNE spend their free time in acquiring skills they may need in their future jobs (Karataş, 2010; Kurtoğlu & Seferoğlu, 2012). When the findings of a study conducted on the graduates of the department are examined, it is also seen that the graduates of the department have opportunities to work in different work areas (Durmaz, 2012). While those, who graduated in the early years, had the chance to work in public or private schools as teachers, consultants, education program consultants, instructional technologists or academicians in the universities (Altun, 2009), it is observed that recent graduates are participating as qualified personnel in the information sector, where there are many job opportunities for these graduates (Seferoğlu, 2007).

It is possible to argue that the tasks expected from CEIT graduates in business environments diverged as the work areas of them began to diverge. As a result, the expected competences of graduates also changed. CEIT graduates who were trained to be teachers were found to be inadequate in certain subjects when they worked in different business sectors. For example, Durmaz (2012) concluded that the graduates of CEIT working in the firms operated in Technopolis were successful in communication and cooperation but not so good in programming and technical skills. In another research conducted by Berkant and Tuncer (2011), it was emphasized that students of the CEIT department were concerned about their lack of computer knowledge and technical knowledge after graduation. In a study conducted by Kıyıcı and Kabakçı (2006), it was also concluded that IT teachers were inadequate in terms of technical knowledge and skills. The researchers emphasized that IT teachers who were CEIT graduates did not receive adequate training in technical subjects during their undergraduate education, and thus, they were found to be insufficient. Therefore, it has been suggested that the curriculum should be updated based on the new findings of the related literature.

In 2006, the CEIT curriculum was updated (YÖK, 2007). During this process, some new courses were added to the curriculum and some courses were merged and their names were changed. There has not been a research study to date conducted on a national scale for the evaluation of the CEIT curriculum, which is still in practice. Considering the changes in technology and changing human characteristics, it is important that teacher training programs are evaluated and updated in light of these developments. Seen from this perspective, it can be said that there is a need for a comprehensive evaluation of undergraduate programs. In this respect, this study aimed to evaluate the undergraduate program of the CEIT department according to the competence perceptions of the graduates.

1.2. Purpose and Significance of the Study

Curricula are very important in terms of organizing and conducting the education process in a planned way. Therefore, changing social, economic and political conditions necessitate the change of educational programs as well. Although it varies across the societies, education has a universal as well as a national quality. In this context, it can be argued that developments in science and technology in global and social contexts, wars, social changes, economic crises, and changing social perceptions result in a change in ideology and philosophy of education as well. These changes which take place in numerous areas are also reflected to ideology and philosophy as well as the education perceptions and perspectives of individuals in the society, and to the basic approaches and methods of educational programs (Gökmenoğlu, Eret & Kiraz, 2010).

The rapid increase in knowledge, which is accepted as one of the most important features of the 21st century, is considered as a driving force for the development of societies. According to Arslan and Erarslan (2003), societies wishing to become an information society should evaluate all aspects of educational systems, which play important roles in upbringing future generations, and should consider the developments in individual, national and universal contexts. High success and efficiency in education can be achieved through good regulation of the learning-teaching environment and effective implementation of the program by teachers with good content knowledge and pedagogical content knowledge (Duman, 2004). When the recent studies on new programs (Akbaş, 2006; Bukova-

Güzel & Alkan, 2005; Bulut, 2006; Ercan & Altun, 2005; Erdoğan, 2005; Gömleksiz, 2005; Gözütok, Akgün, & Karacaoğlu, 2005; Korkmaz, 2006; Özdemir, 2005; Şahin, Turan, & Apak, 2005; Yıldırım, 2006) are examined, it is seen that, in the majority of the studies, primary or secondary education programs have been evaluated. Furthermore, it is remarkable that there are only a few studies conducted on the evaluation of higher education programs to date.

As stated by Kumral and Saracaloğlu (2011), the process of evaluating the curriculum of higher education institutions that train teachers for primary and secondary education institutions has not been given the importance it deserves It is considered significant for institutions training teachers to carry out research studies evaluating their curriculums, because universities should be the institutions that follow the developments and update themselves accordingly. On the other hand, universities have no obligations to appoint their graduates to any position, but they do have to clearly define what qualifications/competences their graduates are to acquire. In this respect, program evaluation studies in higher education are considered to be important.

When the program evaluation studies conducted so far are examined, it is observed that these studies have generally been conducted on the people who will implement the program. Furthermore, when the program changes made in Turkey are examined, it is also seen out that the changes are not made on the basis of program evaluation studies (YÖK, 1997; YÖK, 1998; YÖK, 2007). Since the changes are not based on scientific and theoretical studies, it can be said that they have been generally made depending on the political agenda in the country. From this point of view, it is possible to say that it is important to carry out program evaluation studies.

In the relevant literature, no study has been found making a general evaluation of the qualifications gained by the graduates of the CEIT departments. Existing studies are usually limited to certain courses (Başboğaoğlu, 2004; Şahinkayası & Şahinkayası, 2004) or conducted on students (Durdu & Yıldırım, 2005; Erkoç & Bayrak, 2008; Keser & Bayır, 2007). Therefore, it is thought that the evaluation of the perceptions of graduates concerning the competences gained through the undergraduate program of the CEIT departments will fill a gap in the literature.

It can be said that studies conducted on graduates are important in terms of program evaluation, because the value of the program can be best evaluated on the basis of its final products, which are the knowledge, skills and behaviors gained by the graduates. Product-based evaluation is an important type of evaluation that facilitates decision-making on the entire program. Product-based evaluation which is based on determining the product quality and which enables to evaluate the program on the basis of the soundness of the program, learning deficiencies as well as teaching efficiency makes sense only if it is conducted with systematic measurements and product-based approaches (Posner, 2004).

When studies on the frequent changes made in the programs in Turkey are examined, it is seen that the studies are not based on any program evaluation data (YÖK, 1997; YÖK, 2006). The undergraduate program of the CEIT departments is not an exception to this general trend. For example, the program developed in 1998, when the department was founded, underwent some changes in 2006 that were not based on comprehensive program evaluation data. In the current study, in order to partially meet the need for evaluation, the undergraduate programs of the department were evaluated in terms of the basic competences gained by the graduates on the basis of their competence perceptions. The results of this study are considered to be significant in that they can be used to make data-driven changes in the programs of the departments. It can be said that this study will contribute to the development of the undergraduate program according to the current requirements. It is thought that the study is significant since it may contribute to filling a gap in the field of program evaluation as well as guiding further research.

1.3. Research Problem
The problem of this study was determined as "Based on the competence perceptions of the graduates, what is the extent to which the undergraduate program of the Computer Education and Instructional Technology Department imparts basic competences to its students?"

1.3.1. Sub-Problems
1. Based on the competence perceptions of the graduates, what is the extent to which the CEIT undergraduate program imparts pedagogical competences to its students?
   1A. Based on the competence perceptions of the graduates;
      1.a1. What is the extent to which the CEIT undergraduate program imparts the competence of Educational Planning and Implementation to its students?
      1.a2. What is the extent to which the CEIT undergraduate program imparts the competence of Development of Educational Software and Materials to its students?

1.a3.   What is the extent to which the CEIT undergraduate program imparts the competence of Educational Communication to its students?

1.a4.   What is the extent to which the CEIT undergraduate program imparts the competence of Security and Ethics in the use of Information and Communication Technologies to its students?

1.a5.   What is the extent to which the CEIT undergraduate program imparts the competence of Preparation and Implementation of Educational Projects to its students?

2. Based on the competence perceptions of the graduates, what is the extent to which the CEIT undergraduate program imparts technological competences to its students?

2A. Based on the competence perceptions of the CEIT graduates;

2.a1.   What is the extent to which the CEIT undergraduate program imparts the competence of Problem Solving in Hardware and Software Installation to its students?

2.a2.   What is the extent to which the CEIT undergraduate program imparts the competence of Ability to use System Software to its students?

2.a3.   What is the extent to which the CEIT undergraduate program imparts the competence of Network and Information Security to its students?

2.a4.   What is the extent to which the CEIT undergraduate program imparts the competence of Ability to use Visual Software to its students?

2. METHOD

This section provides information about the research model, the study group, the development of the data collection tools, the implementation process, data collection, data analysis, internal validity, external validity and reliability of the study.

2.1. Research Model

This study was designed using the general survey model. In this study, qualitative data were collected, analyzed and interpreted. General survey models are used to review applications conducted on the entire population, or on a group or a sample from the population, in order to make a general judgment about the entire population consisting of many elements (Karasar, 2010). The survey method, in which surveys or scales are used as the data collection tools, allows the researcher to describe the existing situation (Cohen, Manion & Morrison 2000; Dörnyei, 2003; Lehtonen & Pakhinen, 2004). In the survey technique, a predetermined set of questions are asked to the participants in a sample from a population (Fogelman & Comber, 2007). According to Frankel, Wallen and Hyun (2012), survey models are used in studies in which the personality traits of a small group that is part of a large group are investigated. The survey models also investigate participants' opinions, competences, ideas, attitudes and beliefs.

2.2. Characteristics of the Study Group

The study group of this study was consisted of individuals who were graduated from the CEIT department. The convenience sampling method was used in the selection of the participants. The convenience sampling method (Teddlie & Yu, 2007) involves incorporating elements, which can be reached easily by the researcher, from the population into the study. This method is used in situations where it is difficult to reach participants as well as in situations where it is not possible to reach the entire population. Convenience sampling is a preferred method for practical and economical purposes.

In online environments, 461 CEIT graduates were reached in total, and the scales developed for the study were administered to these graduates. The data collection tools which were presented in an online platform were answered on a voluntary basis. Quantitative data obtained were analyzed and reported. Demographic information of the participants is presented in Table 1.

Table 1. Distribution of the Personal Information of the Study Group (N= 461)

Variables	Groups	f	%
Gender	Female	218	47
	Male	243	53
	Total	461	100
Age	20-24 years old	240	52
	25-29 years old	164	35
	30-34 years old	50	11
	34 and over	7	2

Graduation Year	2002-2006	57	13
	2007-2011	164	35
	2012 and later	240	52
Total		461	100

When the data in Table 1 are examined, it is seen that 47% of the CEIT graduates are female graduates and 53% are male graduates. When the graduation years of the participants are examined, it is seen that there is no balanced distribution by the years. For this reason, it was decided to divide them into groups such as the graduates of 2002-2006, 2007-2011 and 2012 and later. According to this grouping, the highest number of participants was reached from the graduates of 2012 and later (52%), while the lowest number of participants was reached from the graduates of 2002-2006 (13%).

2.3. Data Collection Tools
In the current study, three data collection tools were used to collect data. These tools are a "Personal Information Form", the "Pedagogical Competence Perception Scale for the CEIT Graduates" and the "Technological Competence Perception Scale for the CEIT Graduates". Data collection tools were administered through an online platform to the participants.

2.3.1. Personal Information Form
The "Personal Information Form" used in the study is comprised of four questions seeking to collect personal information about the graduation year, professional experience (length of service), and the institution in which s/he works. In the process of developing the personal information form, first of all, the variables to be studied in the study were determined and questions related to these variables were developed. The personal information form, consisting of a total of 4 questions, was administered to the participants before the competence perception scales.

2.3.2. Pedagogical Competence Perception Scale for the CEIT Graduates
During the development process of the "Pedagogical Competence Perception Scale for the CEIT Graduates", initially, the literature was reviewed and no scale was encountered in the reviewed databases that can be related to this subject. As a result of this review, it was decided to develop a data collection tool that measures the pedagogical competence perceptions of the CEIT department graduates.
The "Pedagogical Competence Perception Scale for the CEIT Graduates" developed in this study is a 30-item scale that aims to determine the competence perceptions of graduates related to the competences that the CEIT department undergraduate program aims to impart to its students. It is a 5-point Likert scale (1- Insufficient... 5- Very sufficient).

As a result of the exploratory factor analysis, a scale was created consisting of 5 dimensions and 30 items. Cronbach Alpha reliability coefficient of the scale was determined as .954. According to this result, it can be said that this scale is reliable (Tabachnick & Fidell, 2001). In addition to the entire reliability analysis of the scale, the reliability of each of the 5 sub-dimensions on the scale was calculated separately. The reliability coefficients for the sub-dimensions of the scale were calculated as .915 for the sub-dimension of "Competence of Educational Planning and Implementation", .912 for the sub-dimension of "Competence of Development of Educational Software and Materials", .905, for the sub-dimension of "Competence of Educational Communication", .876 for the sub-dimension of "Competence of Security and Ethics in the use of Information and Communication Technologies", and .927 for the sub-dimension of "Competence of Preparation and Implementation of Educational Projects".

2.3.4. Technological Competence Perception Scale for the CEIT Graduates
The "Technological Competence Perception Scale for the CEIT Graduates" is a 24-item scale developed to determine the perceptions of CEIT department graduates related to their technological competences gained in the CEIT department. It is a 5-point Likert scale (1- Insufficient... 5-Very sufficient).

This scale is comprised of 4 dimensions and 24 items. The Cronbach Alpha reliability coefficient of the scale was determined as .959. According to this result, it can be said that this scale is reliable. In addition to the entire reliability analysis of the scale, the reliability of each of the 4 sub-dimensions on the scale was calculated separately. The reliability coefficients for the sub-dimensions of the scale were calculated as .963 for the sub-dimension of "Competence of Problem Solving in Hardware and Software Installation", .933 for the sub-dimension of "Competence of Ability to use System Software", .861 for the sub-dimension of "Competence of Network and Information Security", and .873 for the sub-dimension of "Competence of Ability to use Visual Software".

2.4. Data Collection Process
In this study, the data were collected online. The final forms of the data collection tools were transferred to the online environment and distributed to the CEIT graduates. The URL address including questions was sent to individuals via email and/or shared in social media platforms. Private messages were written to each person while sending the URL address. In short, the URL addresses of the data collection tools were distributed to the participants individually. In this process, messages were sent to about 1000 CEIT graduates. At the end of the process, a total of 461 forms were returned.

2.5. Data Analysis Process
In this study, the quantitative data were collected online. The data were recorded on "Google.docs" system. First, the data stored online were saved through the MS Office Excel. A data set was created by editing the data in Excel program. The data were analyzed using the SPSS 17 package program. During the data check, the data considered to be incomplete were not included in the analyses. During the scale development process, factor analysis was performed using the SPSS program. In the analysis and interpretation of the data, frequency, percentage, standard deviation, one-way variance analysis (Anova) and Tukey test were used. Based on the assumption that the score intervals are equal in the responses to scale items, the score interval was calculated as 0.80 by subtracting the highest value from the lowest value and dividing it by the number of intervals. The intervals are given below.

- ☐ 1.00 --1.80 ➔ insufficient
- ☐ 1.81---2.60 ➔ almost insufficient
- ☐ 2.61---3.40 ➔ less sufficient
- ☐ 3.41--- 4.20 ➔ sufficient
- ☐ 4.20 and over ➔ very sufficient

2.6. Internal and External Validity of the Research
While the controls applied in the study are all planned to increase internal validity, it should be noted that a highly controlled environment threatens external validity (Karasar, 2004). There were certain factors that increased the internal validity of the current study: the participants were not asked to give their identifications in order to encourage them to reveal their true views without any apprehension and their participation in the research was on a voluntary-basis..

External validity is the ability to generalize the findings obtained from the sample studied to the population and to daily life (Fraenkel & Wallen, 2006; Karasar, 2004). In the current study study, in the process of reaching the CEIT department graduates, individuals living in different cities, graduated from different universities and working in different business areas were reached to provide a diversity of participants.

The validity and reliability of the data collection tools used in the study were examined. During the implementation of the scales, due importance was shown to provide same conditions for the participants.

3. FINDINGS AND DISCUSSION
In this section, the research findings concerning the sub-problems and interpretations of these findings are discussed.

3.1. Findings Concerning the Extent to Which the CEIT Department Undergraduate Program Imparts Pedagogical Competences to Its Students
The first problem of the research was determined as "*Based on the competence perceptions of the graduates, what is the extent to which the CEIT undergraduate program imparts pedagogical competences to its students*?" In order to answer this research question, the data collected through the "Pedagogical Competence Perception Scale for the CEIT Graduates (PCPSCG)" were used. The Pedagogical Competence Perception Scale for the CEIT Graduates has five sub-dimensions. These sub-dimensions are, "Planning and Implementation of Education", "Development of Educational Software and Materials", "Educational Communication", "Security and Ethics in the use of Information and Communication Technologies", and "Preparation and Implementation of Educational Projects". The responses given to the sub-problems of the first research question are presented below.

3.1.1. Findings Concerning the Extent to Which the CEIT Undergraduate Program Imparts the Competence of Development of Educational Planning and Implementation to Its Students
The responses of the CEIT graduates given to the items in the Planning and Implementation of Education sub-dimension of the Pedagogical Competence Perception Scale for the CEIT Graduates are given in Table 2. When the mean score calculated for the responses given to the competence items of this sub-dimension (3.78) was examined, it was determined that the graduates of the department were quite adequate in terms of their ability in

planning and implementing education. As a result, it was understood that the perceptions of the CEIT graduates were quite high regarding the acquisition of the Educational planning and implementation competence.

Table 2. Competence Perceptions of the CEIT Graduates about Educational Planning and Implementation (N=461)

Items	Lowest	Highest	Mean	Standard Deviation
Ability to determine appropriate learning objectives for the target audience	1	5	3.75	.873
Ability to organize the learning environment appropriate to the target audience	1	5	3.82	.881
Ability to choose the strategy, method, and technique required for the teaching-learning process	1	5	3.85	.891
Ability to prepare content appropriate to the target audience	1	5	3.84	.856
Ability to choose assessment and evaluation methods appropriate to the target audience	1	5	3.71	.937
Ability to determine the learning needs of the target audience	1	5	3.75	.918
Ability to plan the teaching process considering the needs of the learner	1	5	3.79	.896
Ability to create course scenario appropriate to the content	1	5	3.79	.942
Educational planning and implementation Sub-Dimension Mean	**1**	**5**	**3.78**	**.712**

Based on the data presented in Table 2, when the responses given to each item in the "Educational Planning and Implementation" sub-dimension were examined, it was observed that the CEIT graduates had high self-perceptions concerning the competences of ability to determine appropriate learning achievements for the target audience (3.75), ability to organize the learning environment appropriate to the target audience (3.82), ability to choose the strategy, method, and technique required for the teaching-learning process (3.85), ability to prepare content appropriate to the target audience (3.84), ability to choose assessment and evaluation methods appropriate to the target audience (3.71), ability to determine the learning needs of the target audience (3.75), ability to plan the teaching process considering the needs of the learner (3.79), and ability to create course scenario appropriate to the content (3.79).

Based on these data, it can be said that the CEIT undergraduate program was successful in terms of equipping its students with the "Competence of Educational Planning and Implementation". The findings of the current study are parallel to those of previous studies (Duman, 2012; Numanoğlu & Bayir, 2009). Considering the facts that the main purpose of the CEIT department is to train teachers of information technologies and that the department graduates are expected to acquire these competences through the core courses, this finding can be interpreted as positive in terms of the undergraduate program.

3.1.2. Findings Concerning the Extent to Which the CEIT Undergraduate Program Imparts the Competence of Development of Educational Software and Materials to Its Students

The second sub-problem of the study is "*Based on the competence perceptions of the graduates, what is the extent to which the CEIT undergraduate program imparts the competence of Development of Educational Software and Materials to its students?*". The responses given to the items in this sub-dimension by the CEIT graduates are given in Table 3. When the mean of the responses given to the competence items of this sub-dimension (3.60) is examined, it is seen that the graduates of the CEIT department are quite adequate in terms of their competence of Development of Educational Software and Materials.

In Table 3, when the means of the responses given to each item in the "Development of Educational Software and Materials" sub-dimension were examined, it was observed that the CEIT graduates had high self-perceptions concerning the ability to develop educational software appropriate to the learner characteristics (3.47), ability to develop educational software appropriate to the program and learning contents (3.63), ability to develop educational software appropriate to the development levels of the learner (3.62), ability to prepare web-supported teaching materials using different programming languages (3.35), ability to design technology-supported learning environments meeting the different needs of the learners (3.57), and ability to prepare teaching materials by using

information technologies (3.96). It is remarkable that the highest competence self-perception mean of the graduates is 3.96 for the ability to prepare teaching materials by using information technologies.

Table 3. Competence Perceptions of the CEIT Graduates about Development of Educational Software and Materials (N=461)

Items	Lowest	Highest	Mean	Standard Deviation
Ability to develop educational software appropriate to the learner characteristics	1	5	3.47	1.100
Ability to develop educational software appropriate to the program and learning contents	1	5	3.63	1.032
Ability to develop educational software appropriate to the development levels of the learner	1	5	3.62	1.038
Ability to prepare web-supported teaching materials using different programming languages	1	5	3.35	1.130
Ability to design technology-supported learning environments meeting the different needs of the learners	1	5	3.57	1.016
Ability to prepare teaching materials by using information technologies	1	5	3.96	.941
Development of Educational software and Material Sub-Dimension	**1**	**5**	**3.60**	**.870**

When the courses in the undergraduate program of the CEIT department were examined, it was observed that the students, who started their education in the department, received content knowledge courses on educational software development and material design from the first year onwards. Therefore, it can be said that the fact that graduates of the department find themselves competent in this regard is a result of the courses they attend in the department. For example, the courses provided in this department such as "Material Design and use in Education, Graphic and Animation in Education, Information Design" can be considered as the indicators of successful results. Therefore, it can be argued that the department imparts the necessary competences in developing educational software and materials to its students. It can be also said that the previous research studies carried out in the field reached conclusions supporting this finding. For example, Şahinkayası and Şahinkayası (2004) and Kılınç (2006) stated that the courses including content on software and material development were very useful for the students of the department.

3.1.3. Findings Concerning the Extent to Which the CEIT Undergraduate Program Imparts the Competence of Educational Communication to Its Students
The third sub-problem of the study is "*Based on the competence perceptions of the graduates, what is the extent to which the CEIT undergraduate program imparts the competence of Educational Communication to its students?*". The responses given to the items in the Educational Communication sub-dimension by the CEIT graduates are given in detail in Table 4. When the means of the responses given to the competence items of this sub-dimension (4.15) was examined, it was determined that the perceptions of the graduates are high regarding the educational communication competence.

Table 4. Competence Perceptions of the CEIT Graduates about Educational Communication (N=461)

	Lowest	Highest	Mean	Standard Deviation
Ability to work in harmony with the teammates	1	5	4.15	.978
Ability to take responsibility	1	5	4.17	.954
Ability to work in a disciplined manner	1	5	3.92	1.035
Helping teammates if needed	1	5	4.35	.858
Ability to express oneself	1	5	4.01	1.001
Ability to use the time effectively (ensuring time management)	1	5	3.80	1.076
Educational Communication Competence Sub-dimension	**1**	**5**	**4.15**	**.795**

When the data in Table 4 were examined, it was observed that CEIT graduates perceived themselves competent in ability to work in harmony with their teammates (4.15), ability to take responsibility (4.17), ability to work in a disciplined manner (3.92), helping teammates if needed (4.35), ability to express oneself (4.01) and ability to use the time effectively (ensuring time management) (3.80). It is remarkable that the highest competence was perceived for "Helping teammates if needed" (4.35). This fact can be an indicator that the CEIT graduates have no problem in their communications with their teammates in their institutions and they are ready to help in any situation. In a study conducted by Durmaz (2012), it was determined that the CEIT graduates were quite competent in the implementation of collaborative works in their work environments, which supports this finding.

According to the data in Table 4, it is seen that the CEIT graduates perceive themselves highly competent in educational communication. Therefore, it can be stated that the courses and projects provided in the department are very successful for the students in gaining these competences. It is possible to say that this finding of the study is supported by the previous studies conducted in the literature (Berkant & Tuncer, 2011; Demirli, Türel, & Özmen, 2010; Karataş, 2010; Kurtoğlu & Seferoğlu, 2012). In short, it can be said that the undergraduate program of the department is successful in imparting educational communication skills to its students.

3.1.4. Findings Concerning the Extent to Which the CEIT Undergraduate Program Imparts the Competence of Security and Ethics in the use of Information and Communication Technologies

The third sub-problem of the study is "*Based on the competence perceptions of the graduates, what is the extent to which the CEIT undergraduate program imparts the competence of Security and Ethics in the Educational use of Information and Communication Technologies?*". The responses of the CEIT graduates given to the items in the Security and Ethics in the Educational use of Information and Communication Technologies sub-dimension are given in Table 5. When the mean of the responses given to the competence items of this sub-dimension (3.71) was examined, it was determined that the graduates of the department perceived themselves adequate in terms of their competence in Security and Ethics in the Educational use of Information and Communication Technologies. As a result, it is observed that the CEIT graduates consider themselves competent in this sub-dimension.

Table 5. Competence Perceptions of the CEIT Graduates about Security and Ethics in the Educational Use of Information and Communication Technologies (N=461)

Items	Lowest	Highest	Mean	Standard Deviation
Ability to lead the school and the environment about the security and responsible use of technology	1	5	3.71	1.025
Ability to ensure students to display positive social and ethical behaviors in using technology	1	5	3.88	.989
Ability to design activities that support the learners to acquire healthy and secure use of computers and other technological tools	1	5	3.75	.987
Informing the learners about the regulations concerning the use of information technologies	1	5	3.55	1.142
Ability to abide by the ethical rules in the use of information technologies	1	5	3.90	1.030
Ability to initiate efforts to meet the educational demands on information technologies that can emerge in the school	1	5	3.53	1.074
Sub-dimension of Security and Ethics in the Educational Use of Information Technology	**1**	**5**	**3.71**	**.819**

As seen in Table 5, the CEIT graduates perceived themselves competent in ability to lead the school and the environment about the security and responsible use of technology (3.71), ability to ensure students to display positive social and ethical behaviors in using technology (3.88), ability to design activities that support the learners to acquire healthy and secure use of computers and other technological tools (3.75), informing the learners about the regulations concerning the use of information technologies (3.55), ability to abide by the ethical rules in the use of information technologies (3.90) and ability to initiate efforts to meet the educational demands on information technologies that can emerge in the school (3.53). It is remarkable that the lowest means were obtained in the competences of informing the learners about the use of information technologies and initiating efforts to meet the educational demands emerging in the school.

When the data in the Table 5 were examined, it was observed that the CEIT graduates perceived themselves quite competent in the teaching process concerning the security and ethics in the educational use of information and communication technologies. Based on this result, it is possible to argue that the courses on security and ethics in the use of information and communication technologies that are given to the students from the first year onwards in the department provided a basic knowledge to the students. Although there is no course directly related to the ethics in the undergraduate program of the department, it is possible to say that the high competence perceptions of the graduates in this subject is probably owing to the inclusion of these subjects in the other courses offered in the department. The courses such as *Use of Information Technologies in Education-1* and the *Use of Information Technologies in Education-2* can be given as examples for these courses. Similar results were reached in previous studies on this subject (Acat et al., 2004; Çuhadar & Dursun, 2010; Kılıçer & Odabaşı, 2006). As a result, it can be stated that, based on the competence perceptions of the participants, the CEIT undergraduate program provides the necessary basic knowledge on the competence about security and ethics in the use of information and communication technologies.

3.1.5. Findings Concerning the Extent to Which the CEIT Undergraduate Program Imparts the Competence of Preparation and Implementation of Educational Projects

The third sub-problem of the study is "*Based on the competence perceptions of the graduates, what is the extent to which the CEIT undergraduate program imparts the competence of Preparation and Implementation of Educational Projects?*". The responses of the CEIT graduates given to the items in the Preparation and Implementation of Educational Projects sub-dimension are given in Table 6. When the mean of the responses given to the competence items of this sub-dimension (4.07) was examined, it was determined that the graduates of the department consider themselves quite adequate in terms of their ability in preparing and implementing educational projects. Based on this finding, it was determined that the perception levels of the graduates are high regarding their competence in preparing and implementing educational projects.

Table 6. Competence Perceptions of the CEIT Graduates about Preparation and Implementation of Educational Projects (N=461)

Items	Lowest	Highest	Mean	Standard Deviation
Ability to conduct need analysis	1	5	4.11	.917
Ability to plan a project	1	5	4.08	.944
Project phasing and implementation	1	5	4.11	.936
Ability to implement the project effectively	1	5	4.00	.984
Sub-dimension of Preparation and Implementation of Educational Projects	**1**	**5**	**4.07**	**.856**

When the data in Table 6 are examined in detail, it can be seen that the participants have high perceptions about ability to conduct need analysis (4.11), ability to plan a project (4.08), project phasing and implementation (4.11), and ability to implement the project effectively (4.00). Based on the findings obtained it is possible to say that the CEIT graduates were quite competent in preparing and implementing educational projects. It can be argued that the projects implemented during the courses given in the department and the Project Development courses achieved their goals. It was also observed in the previous studies conducted in the literature that graduates of CEIT department undergraduate program gained certain skills about preparing and implementing educational projects (Durdu, 2004; Seferoğlu & Akbıyık, 2009).

3.2. Findings Concerning the Extent to Which the CEIT Department Undergraduate Program Imparts Technological Competences to Its Students

The second research question is "*Based on the competence perceptions of the graduates, what is the extent to which the CEIT undergraduate program imparts technological competences to its students?*". In order to answer this research question, the data were collected through the *Technological Competence Perception Scale for the CEIT Graduates*. The *Technological Competence Perception Scale for the CEIT Graduates* has four dimensions. These are the competences of "Problem Solving in Hardware and Software Installation, Ability to use System Software, Network and Information Security, and Ability to use Visual Software"..

3.2.1. Findings Concerning the Extent to Which the CEIT Undergraduate Program Imparts the Competence of Problem Solving and Software Installation to Its Students

The first sub problem of the second research question is "*Based on the competence perceptions of the graduates, what is the the extent to which the CEIT undergraduate program imparts the competence of Problem Solving in Hardware and Software Installation?*" The data concerning the *Problem Solving in Hardware and Software*

Installation sub-dimension of the *Technological Competence Perception Scale for the CEIT Graduates* are given in Table 7. When the mean of the responses (3.41) given to the questions in this sub-dimension was examined, it was observed that CEIT graduates perceived themselves *less competent* in this competence.

Table 7. Competence Perceptions of the CEIT Graduates about Problem Solving in Hardware and Software Installation (N= 461)

	Lowest	*Highest*	*Mean*	*Standard Deviation*
Ability to solve hardware problems	1	5	3.55	1.221
Ability to solve technical problems	1	5	3.42	1.255
Ability to produce alternative solutions for technical problems	1	5	3.43	1.243
Ability to solve hardware and software problems emerging in the daily use	1	5	3.56	1.151
Ability to identify the hardware and software problems emerging in the daily use	1	5	3.65	1.135
Providing technical support for other units	1	5	3.24	1.228
Ability to develop and implement repairs and maintenance strategies for software, hardware and network elements	1	5	3.16	1.221
Ability to plan periodical repairs and maintenance for software, hardware and network elements	1	5	3.22	1.256
Ability to install a goal-oriented computer system	1	5	3.33	1.367
Ability to recognize software and peripheral components compatible with the installed system	1	5	3.52	1.300
Ability to install a goal-oriented network system	1	5	3.31	1.273
Ability to define and use the software and peripheral systems compatible with the computer and network systems	1	5	3.41	1.235
Ability to ensure communication among the computers	1	5	3.52	1.192
Ability to maintain the existing systems	1	5	3.43	1.204
Sub-dimension of Problem Solving in Hardware and Software Installation	**1**	**5**	**3.41**	**1.013**

When the data in Table 7 are examined in detail, it is seen that the CEIT graduates perceived their competence *sufficient* in ability to solve hardware problems (3.55), ability to solve technical problems (3.42), ability to produce alternative solutions for technical problems (3.43), ability to solve hardware and software problems emerging in the daily use (3.56) and ability to identify the hardware and software problems emerging in the daily use (3.65). However, they perceived their competence as *less sufficient* in providing technical support for other units (3.24), ability to develop and implement repairs and maintenance strategies for software, hardware and network elements (3.16) and ability to plan periodical repairs and maintenance for software, hardware and network elements (3.22).

When the data in Table 7 are interpreted, it can be argued that the competence perceptions of the CEIT graduates were *insufficient* in *problem solving in hardware and software installation*. It is possible to say that the graduates of CEIT department consider themselves competent in identifying and eliminating a hardware problem. However, they consider themselves *less sufficient* in providing technical support, planning and developing repairs and maintenance strategies. It can be said that this result can be considered as normal, due to the fact that the number of the technical courses given in the department is very few, and the department, which is a teacher-training department, aims to develop educational skills of its graduates rather than technical skills.

Additionally, the fact that some competence perceptions are higher can be attributed to the courses provided in the department. It can be said that the department students acquire these competences through the hardware courses. The findings of a study conducted by Çoklar and Şahin (2008) also support this finding. In addition, CEIT graduates may perceive themselves competent in certain subjects since they feel more prone to technology owing to their fields. Seferoğlu and Akbiyik (2009) reported that the students of CEIT department and CEIT-graduate IT teachers were more successful in solving hardware problems.

3.2.2. Findings Concerning the Extent to Which the CEIT Undergraduate Program Imparts the Competence of Ability to use System Software to Its Students

Another sub-problem of the study is "*Based on the competence perceptions of the graduates, what is the extent to which the CEIT undergraduate program imparts the competence of Ability to use System Software?*" The findings concerning the *Ability to use System Software* sub-dimension of *Technological Competence Perception Scale for the CEIT Graduates* are given in Table 8. When the mean of the responses (2.81) given to the items in this sub-dimension were examined, it was observed that CEIT graduates perceived themselves *less sufficient* in *ability to use system software*.

Table 8. Competence Perceptions of the CEIT Graduates about Ability to use System Software (N=461)

Items	Lowest	Highest	Mean	Standard Deviation
Ability to write SQL query	1	5	3.04	1.352
Ability to use the Oracle, SQL, and PL/SQL languages	1	5	2.62	1.294
Ability to use database programs effectively	1	5	2.92	1.276
Having a good level of SQL knowledge	1	5	2.67	1.307
Sub-dimension of Ability to use System Software	**1**	**5**	**2.81**	**1.192**

When the data presented in Table 20 were examined, it was observed that the competence perception means of the CEIT graduates in ability to write SQL query (3.04) and ability to use database programs effectively (2.92) were lower compared to those of the ability to use the Oracle, SQL, and PL/SQL languages (2.62) and having a good level of SQL knowledge (2.67).

Based on these data, it is understood that the competence perceptions of the CEIT graduates concerning the ability to use system software are not so high. Considering the fact that there are basic courses of databases and programming languages in the department, it can be asserted that the lower competence perceptions of the participants may be due to the fewer number of courses. However, taking into account that the CEIT department is a teacher-training department, it can be thought to be normal that the department graduates perceived themselves *less sufficient* on system software competence. When the certain courses such as "*Computer Networks and Communication*" and "*Operating Systems*" offered in the department are examined, it can be argued that basic knowledge is given to the students in these subjects at undergraduate level. Therefore, it should not be perceived as a surprising result that the department graduates perceived themselves *less sufficient* on a subject that they have basic knowledge. At this point, it can be said that the graduates of CEIT department undergraduate program is *less sufficient* in gaining competence of *ability to use system software*.

3.2.3. Findings Concerning the Extent to Which the CEIT Undergraduate Program Imparts the Competence of Network and Information Security to Its Students

The findings concerning the sub-problem "*Based on the competence perceptions of the graduates, what is the extent to which the CEIT undergraduate program imparts the competence of Network and Information Security?*" were obtained through the *Network and Information Security* sub-dimension of the *Technological Competence Perception Scale for the CEIT Graduates*. Data concerning the competence perceptions of the participants about the *network and information security* are presented in Table 9. It is observed that the general mean of the participants concerning the network and information security sub-dimension was *almost insufficient* (2.53) and the graduates did not perceive themselves as competent in this subject.

Table 9. Competence Perceptions of the CEIT Graduates about Network and Information Security (N=461)

Items	Lowest	Highest	Mean	Standard Deviation
Having knowledge about the standards of information security (ISO 27001, PCI DSS, CoBİT, etc.)	1	5	2.18	1.215
Having knowledge about security processes and technologies (penetration test, stress test, encryption, firewall, attack prevention systems, vulnerability of scanning systems etc.)	1	5	2.71	1.259
Having knowledge about network and system security	1	5	2.71	1.167
Sub-dimension of Network and Information Security	**1**	**5**	**2.53**	**1.074**

When the data presented in Table 9 were examined in detail, it was observed that the CEIT graduates had the lowest competence perception (2.18) in *having knowledge about the standards of information security such as ISO 27001, PCI DSS, CoBIT, etc.* followed by *having knowledge about security processes and technologies such as*

penetration test, stress test, encryption, firewall, attack prevention systems, vulnerability scanning systems etc. (2.71) and *having knowledge about network and system security* (2.71).

According to the data in Table 9, it can be concluded that CEIT graduates do not perceive themselves competent enough in *network and information security*. When the courses provided in the CEIT department undergraduate program were examined, it was observed that the courses provided in this subject were very few and only at basic level, which can be a reason why the graduates perceived their competence as *insufficient*. Additionally, taking into consideration that the CEIT is a teacher-training-oriented department, it can be argued that the department cannot develop this competence in students. As a conclusion, based on the competence perceptions of the graduates, it is understood that the competence in *network and information security* cannot be developed at the department.

3.2.4. Findings Concerning the Extent to Which the CEIT Undergraduate Program Imparts the Competence of Ability to use Visual Software

In order to find answers to the sub-problem "*Based on the competence perceptions of the graduates, what is the extent to which the CEIT undergraduate program imparts the competence of Ability to use Visual Software?*", the findings obtained from the responses given to the items in the *Ability to use the Visual Software* sub-dimension of the *Technological Competence Perception Scale for the CEIT Graduates* were used. Details of the findings are presented in Table 10. It is observed that the general mean of the participants concerning the *ability to use visual software is sufficient* (3.51). It is understood that the graduates perceive themselves as competent in *ability to use visual software*.

Table 10. Competence Perceptions of the CEIT Graduates about Ability to use Visual Software (N=461)

Items	Lowest	Highest	Mean	Standard Deviation
Ability to use the software necessary for Graphics Software,	1	5	3.49	1.162
Ability to use animation preparation software	1	5	3.51	1.197
Ability to use the software necessary for the web design	1	5	3.54	1.161
Sub-dimension of Ability to use Visual Software	**1**	**5**	**3.51**	**1.048**

When the data presented in Table 10 were examined, it was observed that CEIT graduates perceived their competence *sufficient* in ability to use the software necessary for Graphics Software (3.49), ability to use animation preparation software (3.51), and ability to use the software necessary for the web design (3.54). When the courses given in the department and their learning outcomes are examined, it can be said that the number of the courses given in the department on this subject is sufficient. Moreover, another reason that the graduates perceived themselves *sufficient* on this subject might be the fact that the graduates naturally have close ties with the technological devices and programs owing to their field of study. As the conclusion, it is observed that the the competence of the graduates about the *ability to use visual software* competence is *sufficient*.

5. CONCLUSIONS and SUGGESTIONS

In this section, the conclusions based on the findings of this study and the suggestions based on these conclusions are included.

5.1. Conclusions

This study was carried out for evaluating the CEIT department undergraduate program according to the competence perceptions of the graduates. For this purpose, the pedagogical and technological competence perceptions of the CEIT department graduates were examined and the program was evaluated according to the competence perceptions of the graduates. The competence perceptions of the CEIT department graduates were determined by the scales developed within the scope of the study. According to the findings obtained from the scales of pedagogical competence perception and technological competence perception, it was revealed that the perceptions of pedagogical competence of CEIT department graduates are higher than their perceptions of technological competence. The pedagogical competence perception scale consists of 5 competence sub-dimensions: " Educational Planning and Implementation", "Development of Educational Software and Materials", "Educational Communication", "Security and Ethics in the Use of Information and Communication Technologies" and "Preparation and Implementation of Educational Projects". The perceptions of CEIT graduates are quite high in all these sub-dimensions. The findings indicate that the CEIT undergraduate program is a powerful program in terms of developing pedagogical competences.

Another conclusion reached in the study is related to the participants' perceptions of technological competence. The technological competence perceptions of the CEIT Department graduates are generally low. The Technological Competency Perception Scale is consisted of four sub-dimensions: "Problem Solving in Hardware and Software Installation", "Ability to use System Software", "Network and Information Security", "Ability to use Visual Software". The perceptions of graduates are high in the "Problem Solving in Hardware and Software Installation" and "Ability to use Visual Software" sub-dimensions. In other sub-dimensions, they have low competence perceptions.

5.2. Suggestions
In this section, some suggestions are made in light of the findings of the current study:
- Within the scope of this study, by taking into account the competence perceptions of CEIT graduates, the product-oriented evaluation of CEIT department undergraduate program was made. A different evaluation can be employed concerning the program elements by using a different program evaluation model, such as including the academicians in this field.
- The program evaluation studies can be done separately for each course based on the courses given in the undergraduate program of the CEIT department.
- Within the scope of this study, the pedagogical and technological competence perceptions were asked to the participating CEIT graduates. A relational study can be conducted by going to the institutions, where graduates work, asking their employers and colleagues about the competence levels of CEIT graduates, and comparing their own competence perceptions and the competence perceptions of their colleagues towards them.

- Within the scope of the study, it was concluded that the undergraduate program of CEIT department was successful in helping its students to gain pedagogical qualifications, while it was less successful in helping its students to acquire technological qualifications. Thus, courses for the development of technological competences can be added to the department's undergraduate program, or the content of existing courses can be updated.
- The main purpose of the CEIT Department undergraduate program is to train teachers. However, by taking into account the developments in technology, developments in the education system across the country and technology-supported projects (such as Fatih Project), further studies can be conducted on the division of the department into different departments such as teacher training and instructional technologies experts training.

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