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Research Article

Comparison of 2017 5th Grade Information Technologies and Software Course Draft Curriculum and 21012 Information Technologies and Software Course Curriculum[1]

Gülten Feryal Gündüz[2], Elif Buğra Kuzu Demir[3]

Abstract

Advances in information technologies (IT) that became prominent since the 1980's gained significance in the 21st century based on the integration of computer technologies with the education-instruction processes and the developments in the fields of technology. In this context, one of the most important steps taken in Turkey was the introduction of the IT course in almost all educational levels to train qualified computer literate individuals. Various new regulations and developments have introduced to the junior high school information technologies and software (ITS) course curriculum based on the developments in science and technologies and the changes introduced to the education system by the Ministry of National Education. The last two of these changes were implemented in 2012 and 2017. The objective of the study was to examine and compare the 2017 draft ITS course curriculum with the 2012 ITS curriculum and demonstrate the advantages and disadvantages of the draft compared to the previous curriculum. The study was conducted as case study, a qualitative research method. The data were gathered with document review and semi-structured interviews. Participants included 20 junior high school ITS course teachers determined with snowball sampling method. The data were analyzed by the descriptive analysis method. Based on the findings, it can be stated that the 2017 draft ITS curriculum has more advantages compared to the 2012 curriculum and the teachers considered the new curriculum draft more effective and applicable. However, it was determined that the textbook should be immediately developed before the implementation of the curriculum.

Keywords: *Curriculum assessment, curriculum development, information technologies and software course.*

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[2] Dr., Ministry of Public Education, gferyal.kucuker@gmail.com, https://orcid.org/0000-0001-8096-5598
[3] Asst.Prof.Dr., Dokuz Eylul University, Buca Faculty of Education, Departman of Computer Education and Instructional Technology, elif.demir@deu.edu.tr, https://orcid.org/0000-0003-1779-5340

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Ortaokul 5. Sınıf 2017 Bilişim Teknolojileri ve Yazılım Dersi Taslak Öğretim Programı ile 2012 Bilişim Teknolojileri ve Yazılım Dersi Öğretim Programının Karşılaştırılması

Öz

Ülkemizde 1980'li yıllarda başlayan bilgisayar teknolojilerine, eğitim-öğretim süreçleri ile bütünleştirilmesine ve teknoloji alanında yaşanan gelişmelere bağlı olarak 21. yüzyılda daha fazla önem verilmeye başlanmıştır. Bu bağlamda, ülkemizde atılan en önemli adımlardan biri de nitelikli bilgisayar okuryazarı bireylerin yetiştirilmesi amacıyla hemen hemen tüm eğitim basamaklarını kapsayacak şekilde bilişim teknolojilerinin bir ders olarak okutulmaya başlanması olmuştur. Ortaokul bilişim teknolojileri ve yazılım (BTY) dersi, öğretim programında bilim ve teknolojideki gelişmelere ve Milli Eğitim Bakanlığı'nın eğitim sisteminde yaptığı yenilikler ile değişikliklere bağlı olarak çeşitli düzenlemeler ve geliştirme çalışmaları yapılmıştır. Bunlardan son ikisi 2012 ve 2017 yıllarında gerçekleştirilmiştir. Bu çalışmanın amacı 2017 BTY dersi taslak öğretim programının 2012 BTY dersi öğretim programı ile karşılaştırılarak incelenmesi ve bir önceki programa göre olumlu ve olumsuz yönlerinin ortaya konmasıdır. Araştırmada, nitel araştırma yöntemlerinden durum çalışması kullanılmıştır. Araştırma verileri doküman incelemesi ve yarı-yapılandırılmış görüşmelerle elde edilmiştir. Araştırmanın katılımcıları, kartopu örnekleme yöntemi kullanılarak belirlenen 20 adet BTY dersi ortaokul öğretmeninden oluşmaktadır. Elde edilen veriler betimsel analiz yöntemiyle çözümlenmiştir. Araştırmanın sonuçlarına göre, 2017 yılı BTY dersi taslak öğretim programının 2012 yılı öğretim programına göre güçlü yönlerinin daha fazla olduğu ve öğretmenler tarafından daha etkili ve uygulanabilir bulunduğu söylenebilir. Bununla birlikte, öğretim programının uygulanmasına geçilmeden önce öğrencilere ders çalışma kitabının ivedilikle hazırlanması gerektiği belirlenmiştir.

Anahtar Sözcükler: *program değerlendirme, program geliştirme, bilişim teknolojileri ve yazılım dersi.*

Introduction

Due to changes and advances in science and technologies in the 21st century, information technologies (IT) became a vital building block for modern societies. Thus, developed and developing countries increasingly pay more attention to the instruction of fundamental IT concepts and the literacy skills in all educational levels from preschool education to post-graduate education. Parallel to this transformation, the policies on the integration of IT in the educational process were revised in 1994 in Turkey and the studies conducted on this context has been increasing ever since. It can be stated that the provision of computers and internet access in schools, the organization of in-service training programs to improve teachers' IT skills, and inclusion of IT courses in the curriculum in almost all education levels have particularly gained momentum since 1998.

The Ministry of National Education (MNE) and teacher training faculties simultaneously introduced certain innovations in order to train teachers equipped with digital competencies that could provide the knowledge that contemporary students require. MNE provided several in-service training activities for teachers to acquire IT literacy skills. Furthermore, Ministry of National Education signed an 80 million dollar agreement with the World Bank in 1998 that aimed to establish computer classes in primary schools in all provinces of Turkey. In this process, the faculties of education that are responsible for training teachers introduced compulsory IT courses such as Computer I-II, Instruction Technologies and Material Development in their curricula. Furthermore, Departments of Computer Education and Instructional Technologies were established in faculties of education to train computer course teachers to be employed in the Ministry of National Education (MNE) elementary schools in 1998 (YÖK, 1998). Thus, the instruction of computer courses commenced in all secondary education institutions in the 1987-1988 academic year and the course was included in the curriculum as an elective computer course for the students to acquire basic computer literacy skills in elementary schools in1998 (MEB İGM, 1998). Elective computer courses are given for one to two hours per week for 1-5 years from the 4th grade in elementary education and implemented with a spiral approach, a content development approach, that includes the topics of previous year and expands by aggregation (Er & Güven, 2008).

Curriculum development process continued to adopt contemporary expectations and scientific and technological advances, to remove the problems in the current curriculum, and due to the innovations and changes conducted by the Ministry of National Education in the education system. Since 2004, significant reforms were introduced to the Turkish Education System. Due to these educational reforms, the existing primary and secondary school curricula was restructures with the constructivist approach and based on the new and contemporary global trends in 2005 (Erdoğan, 2007). In 2006, the computer course curriculum was also renewed and over time the name of the course was changed to "Information Technologies". The new 1-3 grade primary education curriculum was implemented in 2006-2007 academic year and the new 4-8 grade primary education curriculum was implemented in the 2007-2008 academic year initially (Tanataş, 2010). The primary goal of this course was to ensure that each student is trained as a computer literate individual before graduating from the primary school. Introducing students to advancing IT during the instruction of the curriculum and help them improve their skills to utilize these technologies in compliance with ethical and social values, and their personal safety, health and attitudes was also identified as a secondary objective of the course (Gülcü, Aydın, & Aydın, 2013). In the 2012-2013 academic year, MNE introduced the elective Information Technologies and Software (BTY) course in the junior high school curriculum along with other important revisions conducted in the Turkish Education System. In this process, instruction of the elective Information Technologies courses was gradually terminated. Although there was a similarity between the name of the former and the courses, there were significant differences in the instruction, utilized instructional approach and content and activities of the ITS course. With a decision taken by the MNe in 2013, the ITS course became compulsory for the 5^{th} and 6^{th} grades in 2013-2014 academic year without any changes in the curriculum. The course remained as an elective course for the 7th and 8th grades (MEB, 2012). Finally, in January 13, 2017, MNE published the ITS course curriculum draft for the evaluation of the stakeholders. The draft was revised based on the recommendations of the public, institutions and organizations and presented to the public opinion on July 18, 2017. It was decided to gradually implement the curriculum approved by MNE starting with the 5^{th} grade in the 2017-2018 academic year. One of the key reasons for the development of the 2017 BTY course curriculum draft was to discuss the strengths and weaknesses of the 2012 curriculum to create a more functional and feasible curriculum.

Literature review demonstrated that several studies were conducted on the assessment of the 2012 ITS curriculum based on the views of teachers, students and parents (Akbıyık & Seferoğlu, 2012; Bahar, Akpınar, Karakoyun, & Koca, 2016; Erçetin & Durak, 2017; Karagözoğlu, 2015; Karakuş, Çimen Çoşğun, & Lal, 2015; Uzgur & Aykaç, 2016). However, there are only a few studies on the assessment of the 2017 curriculum draft (Bilişim Teknolojileri Eğitimcileri Derneği, 2017; Mercimek & Ilic, 2017). The fact that only a few studies were conducted on ITS course curricula with participants of different demographics characteristics, different instructional approaches and based on various variables prevented the formation of a comprehensive knowledge base, limiting the scope of the existing studies. Furthermore, there were no studies that compared the two above-mentioned curricula in the literature. In this perspective, the present study is significant since it is one of the initial studies conducted on the comparison of the 2012 and 2017 draft curricula. Furthermore, rapid developments and transformations in the field of information and communication technologies make it necessary to constantly assess the efficiency of a curriculum developed in this field in order to maintain the sustainability of the curriculum. It is considered that it is important to address the views of stakeholders such as academicians, teachers, students, and parents who participated in the development and implementation of the curriculum to overcome the problem areas in the curriculum with further development. Here, the greatest responsibility befalls to the Information Technologies and Software course teachers, who are the implementers of the curricula. It is considered that the problems related to the curriculum could be removed and the educational quality and productivity could be improved thanks to the views of teachers who have the opportunity to directly observe and collect data on the developments (Karal, Reisoğlu, & Günaydın, 2010). Based on the above-mentioned criteria, the main objective of the present study was to examine the 2017 ITS course draft curriculum in comparison with the 2012 ITS curriculum. For this purpose, the following research questions were determined:

1. What are the similarities and differences between the 2017 ITS draft curriculum and 2012 ITS curriculum based on
    1.1. the vision and main approach,
    1.2. general objectives and achievements,
    1.3. learning content,
    1.4. instruction-learning process,
    1.5. measurement-evaluation processes?

2. What are the views of information technologies course teachers on the strengths and weaknesses of the 2017 draft curriculum when compared to the 2012 curriculum based on
    2.1.the vision and main approach,
    2.2.general objectives and achievements,
    2.3.learning content,
    2.4.instruction-learning process,
    2.5.measurement-evaluation processes?

Methodology

Research Model

The present study was designed as a case study, a qualitative research method. Case study is defined as a unique study methodology that investigates a current phenomenon, event, individual or institution in depth and longitudinally in social sciences fields such as psychology, sociology and educational sciences (Parker, 2015; Yin, 2002). Thus, the concept referred to as the case can be a series of processes that scrutinize a particular individual, a student community, an accident, or the application of a curriculum (Glesne, 2011 cited by Parker, 2015, p. 119). The main objective of case studies, which are frequently used to answer "what" questions based on the "how" and "why" questions in the field of education, is to discover, describe in detail and interpret a phenomenon, an event, an individual or an institution in its natural environment (Hays, 2004; Yıldırım & Şimşek, 2008).

Study Participants

Study participants included 20 information technologies course teachers employed in a junior high school in Eskişehir province teaching 5th grade ITS course. The snowball sampling, a non-probabilistic (purposive) sampling method was used to obtain in-depth information about the discovery and explanation of existing phenomena and events related to the topic (Patton, 1990). In snowball sampling method, sampling is carried out in a process. The sampling

process begins with the access to an individual that could provide extensive information on the answers of research questions. After the data collection conducted with this participant, other participants recommended by this initial participant are accessed and each individual is asked to propose new participant candidates. The process ends when the names proposed by the participants focus on certain individuals. The focus group constitutes the study sample (Başaran, 2017). The snowball sampling method was used in the study to access the participants who instructed the ITS course for at least one full academic year with the 2012 curriculum and have information on the curriculum announced as the draft in 2017. The additional participants were access with the recommendation of the initial participants. In the context of the study, the researchers posed the following questions to the participants to determine the participants: "Who are the 5th grade teachers, who have instructed the ITS course under the 2012 curriculum, and have knowledge on the 2017 draft curriculum and you can recommend?" (Patton, 2002). The study participants included 12 male and 8 female teachers. Among these teacher, 15 had 0-10 years of tenure and 5 had 11-20 years of tenure.

Data Collection

The study data were collected with qualitative research methods of document review and semi-structured interviews conducted with teachers. The 2012 Information Technologies and Software Course (5th, 6th, 7th and 8th grades) curriculum and the 2017 Information Technologies and Software course (1st-4th grade, 5th, 6th, 7th and 8th grades) draft curriculum, which were used in the document review, were obtained from the official Ministry of National Education, Board of Education website. In addition to document review, a semi-structured interview form that included seven questions was used in the study to obtain teachers' views on the curricula. In the process of developing the interview form, a draft interview form was designed primarily by the researchers and it was reviewed by two field specialists, one from the field of curriculum development and one from the field of information technologies, to establish validity. Based on expert feedback, a question was removed from the draft interview form that included eight questions and the proposed reviews were conducted for clarity and comprehensibility of the form. The draft form was applied to three information technologies and software course teachers to determine the comprehensibility of the form. The teachers stated that the interview questions were clear and comprehensible. The final teacher interview form included two personal questions and five questions on the vision, achievements, content,

learning-instructional processes and evaluation dimensions of the 2012 information technologies course curriculum and 2017 information technologies and software course draft curriculum. The interviews conducted with the semi-structured interview form were recorded after the participant permissions were obtained. Interviews were conducted with the teachers at their school of employment and at their convenience. All interviews lasted about 610 minutes.

Data Analysis

Descriptive analysis was used in the analysis of qualitative data obtained with the document review and the semi-structured interviews. Descriptive analysis involves the analysis of qualitative data by summarizing and interpretation of the data obtained with various data collection instruments based on the themes determined with the literature review conducted prior to the study (Özdemir, 2010; Yildirim & Şimşek, 2008). The descriptive analysis steps include the formation of the descriptive analysis framework, data processing based on the thematic framework, the identification and interpretation of the findings (Yıldırım & Şimşek, 2008). In the study, the vision and basic approach, the general objective and achievements of the curricula, learning content, the instruction and learning processes and the measurement - evaluation process dimensions constituted the descriptive analysis framework. The compared curricula were classified based on themes in the determined framework. Each dimension constituted a theme. Curricula documents and semi-structured interviews conducted with the teachers were examined by the two authors. The study data were analyzed based on the themes determined with consensus of the authors. The analysis findings are presented in tables and figures are presented in frequencies and percentages based on the themes. Instead of the real names of the participants, assigned nicknames (such as ITT1, ITT2) were used and the data were supported with direct quotes from the interview transcripts.

Validity and Reliability

To determine the study validity, the audio records of the data obtained in semi-structured interviews were initially examined and transcribed. Full interview manuscripts were presented to the participant for consistency (Silverman, 2006). Researcher triangulation was also conducted to ensure reliability (Patton, 2002). LeCompte & Goetz (1982) indicated that it is

important to receive assistance from another researcher in confirming the study data and results in order to improve the reliability (Cited by Yildirim and Şimşek, 2008). Thus, documents and semi-structured interviews were coded separately by the authors, as well as an information technologies course teacher and a curriculum development specialist. The inter-judge reliability was calculated with the formula "Reliability = [Agreement/(Agreement + Disagreement)] x 100" (Miles & Huberman, 1994). It was determined that the agreement rate obtained for the curricula documents was 87.5% and the same figure for the interviews was 91%. The points of disagreement were resolved by conducting discussions until a consensus was reached. LeCompte and Goetz (1982) proposed that the collected data should first be presented directly with a descriptive approach in order to improve reliability in qualitative research, and the researcher should submit the data obtained through observations, interviews and document review to the reader without comments and present the comments at a later stage (Cited by Yildirim & Şimşek, 2008). The data obtained with the document review and semi-structured interviews are presented as direct quotations without any interpretation. Conclusions and interpretations on the findings are presented in the discussions section with a holistic approach. To improve the reliability and validity of the study, data diversity method, which is defined as using multiple data collection methods and presenting the collected data in a supportive and confirming manner, was also utilized. Data obtained with document review and interview data collection instruments were used in the study. In data analysis, the correlations and the consistency of the information obtained with these different data collection instruments were examined.

Findings

2012 ITS course curriculum and 2017 ITS course draft curriculum were examined comparatively based on the vision and main approach of the curricula, general objectives and achievements, learning content, instruction-learning and measurement-evaluation processes utilized in the curricula.

Comparison of the Curricula Based on the Vision and Main Approaches

Data obtained with the document review on the visions of the 2012 and 2017 curricula are presented in Table 1:

Table 1
Comparison of the Visions of the 2012 and 2017 ITS Course Curricula

The Vision of 2012 ITS Course Curriculum	The Vision of 2012 ITS Course Draft Curriculum
Success of the Fatih project Training individuals who can learn new technologies by themselves and cultivate a culture of accurate use of new technologies	To allow the equal development of students' emotional, cognitive and social abilities as much as possible

Document analysis findings demonstrated that both curricula lacked a direct vision. However, the explanations included in the curricula documents provided information about the vision of the programs. As seen in Table 1, the vision of the 2012 ITS course curriculum was to ensure the success of the Fatih project and training individuals who are able to learn new technologies by themselves and cultivate a culture of accurate use of new technologies. The curriculum emphasized the necessity of a training program to achieve success in Fatih project and to achieve the goal of information society. However, the 2012 ITS curriculum aimed to replace the instructional structure where only office automation was instructed with one that aims to train individuals with knowledge on individually and socially significant issues such as information literacy, ethical values in technology use and production, aesthetics, confidentiality, information security and cybercrime.

On the other hand, 2017 ITS draft curriculum focused on improving emotional, intellectual and social skills of the students as much as possible. Rather than focusing on educating students who are familiar with basic computer concepts and use office automation software, both curricula shared the vision of training good digital citizens who acquire advanced information technology skills to be beneficial for their country and themselves as a result of computer training. However, while the 2012 curriculum focused more on the success of the Fatih project and, in this context, on the intellectual skills of the students in information technologies, the new curriculum focused more on social, cultural and emotional skills in addition to intellectual skills to train global citizens. In addition to the comparison of the curricula based on their visions, it is also important to compare the basic approaches adopted in these curricula. In the

conducted document analysis, the educational philosophies, curriculum development models and the approaches in creating program content adopted in these curricula were also considered. In this context, the main approaches adopted by the two above-mentioned curricula are presented in Table 2.

Table 2
Comparison of the Main Approaches Adopted in 2012 and 2017 ITS Course Curricula

The Main Approach Adopted in 2012 ITS Curriculum	The Main Approach Adopted in 2017 ITS Draft Curriculum
It was based on constructivist learning approach. It adopted Tomei's technological taxonomy and Ainley's computer and information literacy stages. Standard based program was adopted.	It was based on constructivist learning approach. It was based on the Turkish competencies framework. Unit based approach was adopted. It focused on value-based education. The significance of counseling was established.

Constructivist learning approach was adopted in both curricula. While the development of the 2012 curriculum was based on a standards-based instructional approach, the unit-based approach was adopted in the 2017 draft curriculum. In 2012 curriculum, standards that reflected the information and communication technologies knowledge and skills were defined. In this context, a framework program was designed based on basic national competencies in the use of information and communication technologies, which was in turn based on the global technological advances. During the determination of these standards, the most valid global standards were analyzed, and curriculum learning standards were established based on the technological taxonomy determined by Tomei and the classification by Fraillon and Ainley (2011). The curriculum included three levels; basic, intermediate and advanced levels, and two sub-levels at each level. Basic I and Basic II levels included the comprehension of information technologies and access and assessment of information, respectively; Intermediate I and II levels included management and transformation of the knowledge, respectively; and Advanced I and II levels included generation of and sharing the information, respectively. It was stated in the curriculum that the teachers should determine the students' levels based on their competencies and conduct the instruction based on the achievements and learning content suitable for the student levels determined at the beginning of the academic year when implementing the curriculum. However, the curriculum did not include any information on the determination of students' readiness levels at the beginning of the academic year. The unit-based approach adopted in the 2017 draft curriculum included topics that complement each other in educational steps under the same units for 5^{th} and 6^{th} grades. One of the most significant

differences in 2017 draft curriculum when compared to the 2012 curriculum was the consideration of the Turkish Competencies Framework (TCF) within the context of lifelong learning. TCF is the national competencies framework that is consistent with the European competencies framework, covering all educational levels (MEB, 2017). Eight key competencies that each individual is expected to acquire in the lifelong learning process are associated with the learning skills that they are expected to acquire in the courses. These key competencies are communication in native language, communication in foreign languages, mathematical competence, core competencies in science / technology, digital competence, learning to learn, social and civic competence, initiative-taking and entrepreneurship perception, and cultural awareness and expressive competences.

When the curricula are compared based on the basic approaches, it can be stated that the 2017 draft curricula focused more on the concept of counseling. The program emphasized individual differences and provided the necessary flexibility for students with special requirements. The fact that values education was included in a separate section was another distinguishing aspect of the 2017 draft curriculum when compared to the 2012 curriculum. Values education included information technology ethics, privacy and security issues related to the course content.

The IT teachers were asked to state the strengths and weaknesses of the 2017 ITS course curriculum and compare the 2017 draft and 2012 ITS curricula based on the curricula visions and basic approaches. The views of the teachers are presented in Table 3:

Table 3
Teacher Views on the Strengths and Weaknesses of the Vision and Basic Approaches of 2012 and 2017 ITS Course Curricula

Views	Frequency (f)
Student-centered	20
More clear and comprehensible	16
More applicable	12
Not rote-based, focusing on learning to learn	12
Suitable for 21st century learners' requirements	8

When they were asked about the curriculum's vision, the majority of ITS teachers primarily stated the changes in the curriculum content. This suggested that a large majority of teachers did not have any information on the vision of the curriculum. As demonstrated in Table 3, only about half of the teachers was able to state the vision of the curriculum. While these teachers indicated that a contemporary vision was established in the 2017 ITS course curriculum and they considered this as adequate, one teacher added that the curriculum lacked information about basic knowledge and skills required to achieve the vision. The views of two teachers on the vision of the 2017 ITS curriculum were as follows:

> *"The 2012 curriculum was a little outdated. 2017 curriculum is a more current program. 2017 is more successful in software and coding and suits the needs of the times." (ITT14)*

> *"As a vision, an attempt was made to develop the curriculum to keep pace with technological developments based on the global circumstances, however application software Office programs could be emphasized further...." (ITT3)*

As seen in Table 3, all teachers expressed positive views on the basic approach utilized in the curriculum and indicated that that the new program was student-centered and reflected a structure that emphasized learning instead of rote-based instruction. When the teachers were asked to compare the 2017 draft to the 2012 ITS curriculum, three teachers stated that the curricula were similar based on their main approaches and the majority of teachers indicated that the basic approach of the new program was clearer and more comprehensible and feasible in the curriculum manual. Teachers' views in this topic were as follows:

> *"I think that the 2017 curriculum definitely has a student-centered approach. It seems like a learning by doing centered curriculum. "(ITT 12)*

> *"In the 2012 curriculum, everything was left open-ended and all could differ from one school to another. A curriculum or program that requires us to act in cohesion was not completely established. It was nice development in this perspective". (ITT14)*

Comparison of the Curricula Based on General Objective and Achievements

The general objectives and achievements are determined by taking into account the reasons for the development of the curricula, related visions and educational philosophies. The

comparative data on the general objective and targeted achievements of the two curricula are presented in Table 4.

Table 4

Comparison of the 2012 and 2017 ITS Course Curricula Based on General Objective and Achievements

General Objective and Achievements of 2012 ITS Curriculum	General Objective and Achievements of 2017 ITS Draft Curriculum
General Objective: Active and productive use of information and communication technologies in compliance with ethical values	General Objective: Training accomplished digital citizens with the skiils to use advanced information and communication technologies
The competencies expected of the students are detailed.	The achievements are associated with TCF competencies. The number of achievements are higher.
The achievements vary based on the computer literacy level of the student.	Association of the achievements with the values is stressed.

When the two curricula were compared based on general objectives and achievements, it was observed that the 2017 ITS draft curriculum contained more detailed general objectives. In the 2012 curriculum, the objective of the curriculum was stated in a single sentence that the aim was the active and productive use of information and communication technologies in accordance with ethical values. However, it was observed that the general objectives stated in the 2017 ITS draft curriculum were presented under the title of achievements in the 2012 curriculum. Thus, when the general objectives of both curricula are compared, it can be argued that the general objectives of the curricula were similar except the general objectives that emphasized the Internet, algorithms and coding in the 2017 ITS draft curriculum. The general objectives mentioned in both programs included acquisition of problem solving, reasoning and collaboration skills, basic knowledge and skills to use information technologies, skills required to develop a unique product, use at least one programming language and lifelong learning skills. Different from the 2012 curriculum, students are expected to develop an understanding in algorithm design, to seek learning opportunities on the Internet, and to develop innovative and free projects to solve problems encountered in daily life (problems encountered by elderly individuals and individuals with disabilities, etc.) in the 2017 draft curriculum.

When the curricula were compared based on targeted achievements, it was observed that the achievements were similar parallel to the similar general objectives, however the number of achievements related to programming were higher in the 2017 ITS draft curriculum. When the

topics were examined individually, the number of the required achievements in "IT technologies," "ethics and security", "communication, research and collaboration", "production" and "problem solving and programming" units were 14, 9, 12, 15 and 27, respectively. The number of achievements in the 2012 ITS curriculum varied based on the student level in six computer literacies included in the curriculum. There were 44 achievements in the comprehension of the information technologies level (Basic I), there were 33 achievements in the access and assessment of information level (Basic II), there were 25 achievements in the management of information level (Intermediate I), there were 26 achievements in the knowledge transfer level (Intermediate II), there were 27 achievements in the information production level (Advanced I), and there were 28 achievements in the information sharing level (Advanced II). Since the level of computer literacy that would be applied based on the level of the students' readiness in computer literacy, hence the targeted achievements varied in the 2012 ITS curriculum, the achievements required for the 5th grade level were not clearly stated. However, it can be argued that 5th grade achievements were more numerous in the new curriculum when it is considered that a maximum of two computer literacy levels and achievements could be achieved in an educational grade.

IT teachers were asked to state their views on the positive and negative aspects of the 2017 draft curriculum by comparing the 2017 and 2012 ITS curricula based on their general objectives and achievements. Teacher views are presented in Table 5.

Table 5
The Views of Teachers on the Positive and Negative Aspects of the General Objective and Achievements of the 2017 ITS Course Curriculum

Views	Frequency (f)
Positive Aspects of the General Objective and Achievements	
More clear and comprehensible	18
Adequate for the student level	15
Negative Aspects of the General Objective and Achievements	
Higher number of achievements	16
Insufficient number of class hours reserved for the achievements	15
Individual and regional differences were ignored	2

When teachers were asked to compare the 2017 ITS draft curriculum and the 2012 ITS curriculum, 18 teachers indicated that the achievements of the new curriculum were more precise. More than half of the teachers stated that the achievements were more adequate for the student level, however the number of achievements was higher when compared to the previous

curriculum. They considered that it would not be possible for the students to acquire all achievements during an academic year based on the number of targeted achievements. Fifteen teachers stated that little time was allocated for MS Office software in the new curriculum and it would not be possible to teach this group of software during the allocated time. Six teachers emphasized that the number of course hours should be increased, while two teachers considered that individual and regional differences were not taken into account in the determination of the achievements. Teachers' views on general objectives and achievements established by the new curriculum were as follows:

> *"It is suitable for the student level, but there are too many achievements for the course hours. In fact, the curriculum for a whole year for this age group is squeezed in a single semester. "(ITT12)*
>
> *"The number of achievements is very ideal. But I think that at least 4 hours is appropriate for 5th and 6th grades for the programs I mentioned above." (ITT10)*
> *"A common mistake was the attempt to standardize regional and social environment differences." (ITT2)*

Comparison of the Curricula Based on Learning Content

The topics included in 2017 ITS draft curriculum and 2012 ITS curriculum and the general characteristics of the curricula content are presented comparatively in Table 6:

Table 6
Comparison of the 2012 and 2017 ITS Course Curricula Content

2012 ITS Curriculum Content	2017 ITS Draft Curriculum Content
✓ Information literacy ✓ Ethical values in teachnology use and production ✓ Information security, privacy and cyber crimes ✓ Internet, communications ✓ Text-based content production, calculation, tabulation and multimedia applications ✓ Problem solving and programming ✓ Learning areas are defined. ✓ Learning topics were identified for each learning area. ✓ Allocated time-class hours were not defined for each learning topic.	✓ Information literacy ✓ Ethical values , digital citizenship ✓ Using serach methods, establishing communications ✓ Privacy, information security ✓ Design and presentation of products such as audio, video, animation and web site ✓ Problem solving and programming ✓ There are 5 consecutive units for 5th and 6th graders. ✓ Learning topics were identified for each unit. ✓ Time/class hours were determined for each learning topic.

As seen in Table 6, common learning topics included in both curricula were information literacy, information security, privacy, multimedia applications, problem solving and programming, Office software and ethics. Learning topics were presented as learning areas in the 2012 ITS curriculum and they were presented under units in the 2017 ITS draft curriculum. The 2012 BTY curriculum did not include a specific level and topics that should be instructed in a particular grade, decisions on the levels and topics are to be made by the teacher. Although there were no significant differences between the learning topics in both curricula, there were differences in the time allocated for learning topics and the sub-topics under the main topics. In 2012 ITS curriculum, a specific time was not allocated for each topic, it was left to the discretion of the teacher, However, in the 2017 ITS draft curriculum, the duration of the course hours allocated for each learning topic was identified. In the new curriculum, less time was allocated for Office software and multimedia applications; the whole second semester was allocated for problem solving and programming.

IT teachers were asked to compare the 2017 and 2012 ITS curricula based on the learning content and to express their views on the pros and cons of the 2017 ITS curriculum. The views of the teachers on the issue are presented in Table 7.

Table 7
Pros and Cons of 2017 ITS Course Curriculum Learning Content According to the Teachers

Views	Frequency (f)
Positive Aspects of the Learning Content	
Achievement of national unity in applications	18
More current learning topics	15
Increased emphasis on programming	15
More interesting learning topics	14
Inclusion of ethical and security issues	2
Negative Aspects of the Learning Content	
High theoretical (unpractical) content	15
Lower time allocated for Office software	15
Repetitions in topics	2
The same as the 2012 IT curriculum	2

As seen in Table 7, the most positive aspects of the 2017 ITS draft curriculum were its clarity in learning topics, unity of its implementation across the country will be ensured and the ability to instruct the topics simultaneously when compared to the 2012 ITS curriculum according to the teachers. Nearly all teachers stated that one of the significant changes implemented in the 2017 ITS draft curriculum was the increased focus on programming. Allocation of more time

for programming was considered by all teachers as an advantage of the curriculum. More than half of the teachers stated that the learning outcomes of the new curriculum were more interesting and more up-to-date when compared to the previous curriculum. Two teachers emphasized that providing technical information, as well as the increased focus on ethics and security were among the important and positive features of the new curriculum. One of the most criticized aspects of the new curriculum was the increase in the number of theoretical topics when compared to the previous curriculum. Several teachers stated that the reduction in the number of applied topics due to the lack of IT laboratories at most schools was not an adequate solution. Instead, they emphasized that it is important to establish IT laboratories at these schools as soon as possible, and the nature of the course requires an increase in applied topics. Majority of the teachers stated that the time allocated for Office software in the new curriculum was not sufficient and it was not possible to instruct Office software in the allocated time. Due to the fact that most topics were theoretical in the 5th grade fall semester curriculum and computer course is an applied topic, this was among the most criticized issues by the majority of the teachers. Two teachers stated that the topics were not repeated in the 2012 curriculum, however in the 2017 draft curriculum, the topics were repeated across grade levels. Teachers stated their views on the 2017 curriculum as follows as a result of their comparison of both curricula:

> *"The most basic, most logical aspect of the 2017 curriculum is that we will be able to act at a certain level within a common framework. This is the most important difference between the two curricula." (ITT4)*

> *"I think that in the 2017 curriculum, the section where the 6th grade students would use audio and video editing tools is suitable for the student interests. The content of the 2012 curriculum was not very clear." (ITT6)*

> *"... the first semester topics are quite verbal. It is possible to instruct almost all topics without turning the computer on, but here it would have been better if the children had the opportunity to turn on their computers and use them." (ITT18).*

> *"More class hours could have been allocated for Office software that the students would needed throughout their lives..." (ITT3).*

Comparison of the Curricula Based on Instruction-Learning Processes

The general characteristics of the instruction-learning processes in the curricula are presented comparatively in Table 8:

Table 8
Comparison of the Instruction-Learning Processes in 2012 and 2017 ITS Course Curricula

Instruction-Learning Process in 2012 ITS Curriculum	Instruction-Learning Process in 2017 ITS Draft Curriculum
Sample learning activities related to learning topics are included. Focused on group and project work. Information on how to organize the instruction-learning process and which instructional approaches, methods and techniques can be used was not provided.	Learning activities are provided for each learning topic. Focused on problem solving, project-based instruction and collaborative learning approaches. Use of computer, tablet or robot kits. Teacher handbook included detailed information on how to instruct each topic, available learning resources, instructional approaches, methods and techniques and learning material. Selection of instructional activities was left to the teacher's discretion due to technical infrastructure and knowledge base issues. Activities that do not require computer use were also included for schools without technical infrastructure.

The comparison of the 2012 ITS curriculum with the 2017 ITS draft curriculum based on instruction-learning processes revealed that the draft curriculum provided more detailed and descriptive information on the instruction -learning process. As seen in Table 8, 2012 ITS curriculum provided no information on how to organize the instruction-learning process and which instructional approaches, methods and techniques should be used. The new curriculum included a teacher's handbook and the handbook provided information on how to instruct each learning topic, available learning resources, which teaching approaches, methods and techniques and learning materials should be used. In both curricula, the significance of collaborative learning and problem solving approaches and the use of instructional methods and techniques based on these approaches were emphasized. 2012 ITS curriculum offered five or six learning activities, which can be used in learning topics. In the new program, there were learning activities that can be conducted in each learning topic and the use of these learning activities is left to the teacher's discretion based on the available technical and information infrastructure. It included activities that can be carried out without using a computer in schools without technical facilities. In the new curriculum, it was mentioned that different learning resources such as tablet computers and robot kits can be utilized.

IT teachers were asked to state their views on the positive and negative aspects of the 2017 curriculum by comparing the 2017 and 2012 ITS curricula based on instruction-learning processes. The views of the teachers are presented in Table 9.

Table 9

The views of the teachers on the positive and negative aspects of the instruction-learning process in the 2017 curriculum

Views	Frequency (f)
The Positive Aspects of the Instruction-Learning Process	
Presence of the teacher's handbook	20
The Negative Aspects of the Instruction-Learning Process	
Inability to instruct applied courses in schools without IT laboratories	18
Course materials are provided only as e-material	15
Lack of Internet access at schools with IT laboratory	12
It is the same as 2012 ITS curriculum	2

All teachers stated that the most positive aspect of the 2017 ITS curriculum the teacher's handbook when compared to the previous 2012 ITS curriculum. They considered the inclusion of 5th grade activities and the sharing the handbook on the internet as a significant development, however 15 teachers emphasized that the distribution of printed course material was also important. Teachers stated that they experienced problems with school administration due to the Xerox costs related to printing and distributing the e-resources. A negative aspect of the instruction-learning process in the new curriculum according to the teachers was the fact that the whole second semester in the 5th grade was devoted to programming and they stated that they worried about instructing the topic, which should be instructed completely in an applied manner even at schools without an IT laboratory. The implementation of the curriculum at schools with IT laboratories but without Internet access was another source of anxiety among the teachers. Teacher views on the positive and negative aspects of the 2017 draft curriculum when compared to the previous curriculum were as follows:

> *"I believe that the fact that the ministry shares the teacher's handbook and course material will have an effect on the acquisition of nationwide achievements that the course aims." (ITT9)*

> *"We have a lot to do on the Internet due to the characteristics of our course. We can find and share examples as required, but if we consider village schools or schools without IT classrooms, it will be easier for the activities determined in the handbook to reach all students. The activities that do not require computer use should be included naturally..."(ITT15)*

Comparison of the Curricula Based on Measurement-Evaluation Processes

The 2017 ITS draft and the 2012 ITS curricula were compared based on the measurement and evaluation processes. The general characteristics of the measurement-evaluation processes in the curricula are presented comparatively in Table 10:

Table 10
Comparison of the 2012 and 2017 ITS Curricula Based on Measurement-Evaluation Processes

Measurement-Evaluation Process in the 2012 ITS Curricula	Measurement-Evaluation Process in the 2017 ITS Draft Curricula
The significance of student participation in the evaluation process was explained. The requirement to conduct the evaluation of the process and the product simultaneously was established. Teacher, student and parent collaboration in evaluation was stressed. The use of product files, self-evaluation/peer-evaluation, rubric and performance evaluation measurement instruments was established. Use of Educational Information Network (EIN) Examples were provided for rubrics, grading scale and control list.	The significance of providing continuous feedback was stressed. Simultaneous use of recognition-oriented, monitoring-oriented and outcome-oriented evaluations was indicated. Recognition-oriented evaluations: readiness tests, observation, interview forms, skill tests, etc. Monitoring-oriented evaluation: monitoring unit tests, authentic tasks, application activities, rubrics, diagnostic branched tree, Word association, self and peer evaluation, group evaluation, projects, observation forms, etc. Outcome-oriented evaluation: final exams, observations, interview forms, applied exams, projects, etc. Recognition of individual differences

It was observed that the use of measurement and evaluation instruments that would contribute to the active participation of the learners in the process was suggested in both curricula when the 2012 ITS curriculum and the 2017 ITS draft curriculum were compared based on measurement and evaluation processes. Self/peer-evaluation, rubric and performance evaluation measurement instruments were the measurement and evaluation instruments specified in both curricula. However, the 2012 ITS curriculum focused on creation of product files, while the 2017 ITS draft curriculum emphasized applied exams. 2012 ITS curriculum emphasized the necessity of process-oriented and product-oriented evaluations to be conducted simultaneously, while the new curriculum emphasized the recognition-oriented, monitoring-oriented and outcome-oriented evaluation methods. It can be argued that the new curriculum stressed recognition-oriented evaluation more when compared to the previous curriculum. In the 2012 curriculum, it was emphasized that the products created by the students should be

shared on the social network called the Educational Information Network (EIN). It can be argued that encouraging the teachers and the students to utilize the EIN social education network was an accurate approach when it is considered that the vision of the 2012 ITS curriculum included the success of the Fatih project. Another difference in the 2017 ITS draft curriculum when compared to the previous curriculum based on the measurement-evaluation process was the increased emphasis on the recognition of individual differences. One of the main shortcomings of the 2017 ITS draft curriculum was the lack of examples related to the use of evaluation instruments. The 2012 ITS curriculum included sample measurement and evaluation tools, albeit only a few.

IT teachers were asked to compare the 2017 and 2012 ITS curricula and to state their views on the positive and negative aspects of the 2017 draft curriculum based on measurement-evaluation processes. Teacher views are presented in Table 11.

Table 11
Teacher Views on the Positive and Negative Aspects of the Measurement-Evaluation Process in 2017 ITS Curriculum

Views	Frequency (f)
Positive Aspects of the Measurement-Evaluation Process	
Active participation of the students	14
Evaluation methods for applications	12
Negative Aspects of the Measurement-Evaluation Process	
The same as the 2012 IT curriculum	15

As seen in Table 11, 14 teachers considered that the measurement and evaluation methods and techniques included in the 2017 ITS draft curriculum could result in increased active participation of the students. Twelve teachers considered the application evaluation methods in the new curriculum as a positive feature when compared to the previous curriculum in terms of measurement-evaluation process. Significant majority of the teachers stated that there was no difference between the new curriculum and the 2012 curriculum based on the dimension of the measurement-evaluation process and instruments. The fact that there was no difference between the previous curriculum and the previous one based on the measurement-evaluation process and instruments was the source of the most significant criticism among the teachers. Teacher views on the measurement and evaluation processes in both curricula were as follows:

"It is a more adequate measurement and evaluation process for applied exams and product evaluation" (ITT1)

"I think that the learners will be more active with the new curriculum and the evaluations will produce more realistic outcomes." (ITT5)

"I do not think there is a difference based on measurement and evaluation." (ITT7)

Discussion, Conclusion and Recommendations

In the present study, 2017 Information Technologies and Software course draft curriculum was compared with the previous program, the 2012 ITS curriculum, and the positive and negative aspects of the new program were determined. For this purpose, curricula were examined, and the views of ITS course teachers were obtained.

When the two curricula were comparatively analyzed, it was observed that they had both similarities and differences. The similarities between the curricula were the presence of the advantages of the 2012 curriculum in the instruction of the course and the acquisition of the specified achievements by the students in the 2017 ITS draft curriculum as well. These included the facts that both curricula were based on the constructivist approach, were student-centered, the learning topic content was almost the same, they both focused on collaboration and group work in the instruction-learning process, the lack of IT laboratories at schools or the lack of Internet access at schools and conducting process and product evaluations were conducted simultaneously in the measurement-evaluation process. Despite there were similarities between the curricula, it can be argued that the differences were more numerous. It can be stated that the main vision of the curricula differed based on the main approaches in determining the learning content, the number of achievements, the time allocated to learning topics, the teacher's handbook and the presence of a teacher's handbook that contained detailed information on the activities that the students should conduct. Some of these differences included work that was conducted to address the problems experienced by teachers during the implementation of the 2012 ITS curriculum, while others stemmed from the completely renewed sections in the 2017 ITS draft curriculum.

Based on the views of teachers, the amendments that aimed to address the problems experienced in the previous ITS curriculum were stated as the positive aspects of the 2017 ITS draft curriculum, however certain novelties in the new curriculum were expressed as negative properties due to their potential to cause new problems. It can be stated that the positive aspects of the 2017 ITS draft curriculum included its emphasis on values education, clear statement of targeted achievements, adoption of a unit-based approach, determination of the time allocated for each course topic, association of lifelong learning skills and curriculum achievements based on national competencies, and development of the teacher's handbook and identification of student activities. Teachers also believed that, unlike the 2012 BTY curriculum, determination of the content with unit-based approach in the new curriculum resulted in a continuum of course topics in different grades in the junior high school and prevented redundant repetition of topics over the years. It can be suggested that lack of topical integrity and leaving the initiative totally to the teacher led to a chaos in the instruction of the information technologies course at the national level. When it is considered that the students in a class could have different computer literacy levels, it can be suggested that problems could be experienced in determination of learning topics. In 2012 ITS curriculum, learning topics were presented based on the targeted knowledge, skills and competencies, however the instruction of these topics based on the grades and the technology literacy of the related class was left to the discretion of the teachers who are the implementers of the curriculum. Erçetin and Durak (2017) stated that the teachers experienced problems mostly due to the ambiguity in the course content during the implementation of the curriculum in a study conducted on the 2012 ITS curriculum. Similarly, Uzgur and Aykaç (2016) also found that the ambiguity in the curriculum content clearly affected the learning process negatively, which was a disadvantage for the teacher and significant learning differences occurred among the schools since the teachers determined the course content in a study they conducted on the 2012 ITS curriculum.

In the 2017 ITS draft curriculum, determination of the hours allocated for the units and course topics within the units was one of the positive aspects of the new curriculum. However, it was found that the class hours allocated for the instruction of Office software was considered as a negative aspect by the teachers and the teachers were concerned about completing the instruction of the course content within the allocated time. Certain teachers also indicated that a whole semester was allocated to programming. It can be suggested that this was due to the fact that within the context of previous curricula since 2005, the ITS curricula predominantly

included the instruction of Office software in primary and junior high schools. Tanataş (2010) also found that IT teachers mostly instructed the introduction to presentation and word processing software the most and programming and the logic of algorithms the least based on teacher views in the thesis study where 2005 primary school elective computer course was scrutinized. It can be argued that due to the fact that the 2012 ITS curriculum allowed the teachers to determine course content, most teachers preferred to instruct Office software in their classes based on the logic of the previous curriculum.

Among the important positive aspects of the 2017 ITS draft curriculum, determination of the learning topics, presentation of all activities and the presence of a teacher's handbook can be listed. Thus, it can be argued that the implementation of the program would provide an integrated education in all junior high schools and there will be no differences among the learning topics that the teachers will instruct. The fact that all activities were not listed in the 2012 ITS curriculum and that the teacher's handbook and the textbook did not exist was among the most criticized topics by the teachers. This study finding was consistent with the results of other studies that scrutinized the 2012 ITS curriculum based on teacher views (Erçetin and Durak, 2017; Uzgur and Aykaç, 2016). Studies in the literature indicated that teachers considered the lack of teachers' handbook problematic and found the learning activities offered in the 2012 ITS curriculum unsatisfactory (Erçetin and Durak, 2017). It can be stated that the teachers considered the lack of learning activities in previous ITS curricula as unsatisfactory as well (Tanataş, 2015). Thus, it can be suggested that one of the most powerful and popular aspects of the 2017 ITS draft curriculum was the presence of the teacher's handbook and listing of all learning activities. Nevertheless, it was observed that most of the activities presented in the new curriculum could also be conducted with worksheets at schools without a computer laboratory. Although this was due to the fact that there are several schools without computer laboratories, ITS course is an applied course and the availability of a computer laboratory is important to conduct the activities that require applied instruction and listed in the teachers' handbook. Theoretical instruction of the course might lead to unfulfillment of the requirements and expectations of the students, and disinterest and negative attitudes towards the course among the students (Bilişim Teknolojileri Eğiticileri Derneği, 2017). Furthermore, the teachers stated the slow Internet connections or the lack of Internet connections at schools with computer laboratories, and unproductive use of the laboratories due to crowded classrooms as other negative aspects of the curriculum. In a study conducted by the Association of

Information Technologies Educators (2017) on the 2017 draft curriculum, the majority of the interviewed teachers stated that the physical infrastructure of their schools was not suitable for the instruction of curriculum content and their classrooms were crowded. In studies on previous ITS curricula instructed in primary and junior high schools, IT teachers always stated the lack of an adequate settings to conduct the applications, slow or no Internet connection, crowded classrooms as problems experienced during the instruction of the course (Erçetin and Durak, 2017; Uzgur and Aykaç, 2016, Tanataş, 2010, Kurarer and Güven, 2008). Thus, it can be argued that it is very unlikely to utilize expensive technological devices such as tablet computers and robotic kits that were proposed in the new ITS draft curriculum with the facilities provided by MNE.

In conclusion, it can be stated that the 2017 ITS draft curriculum was more positive and stronger than the previous curriculum. Furthermore, it is considered that the number of achievements in the draft curriculum should be revised and reorganized so that these could be achieved in an academic year. Half of the academic year was reserved for the instruction of the algorithms unit in the curriculum. The schools without computer laboratories or with insufficient laboratories should be provided with the required facilities before the implementation of the curriculum to enable the effective and relevant instruction of the topics scheduled for the last six weeks of this unit that require the students to code software using a computer. The student textbook that conforms to the requirements of the draft curriculum should urgently be published. In order to determine the problematic aspects of the program and the relevance of teachers' concerns, the new curriculum should be assessed during implementation and at the end of its initial instruction. The present study results are based on the collected qualitative data. The ITS curriculum should be reassessed using quantitative or mixed methods to obtain more general findings on the curriculum, to obtain higher number of participant views and to improve data diversity. It is also considered that a similar research conducted by obtaining the views of other stakeholders of the curriculum such as students and parents in addition to the views of the teachers would further contribute to the literature.

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