COMPUTER EDUCATION IN TURKISH BASIC EDUCATION SCHOOLS: GAPS BETWEEN POLICY AND PRACTICE

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ABSTRACT

COMPUTER EDUCATION IN TURKISH BASIC EDUCATION SCHOOLS: GAPS BETWEEN POLICY AND PRACTICE

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The purpose of this study is to investigate the current status of computer education in Turkish basic education schools by exploring the perceptions of computer teachers in terms of the policy of new computer education curriculum, which was prepared in 2006, and its actual implementations in schools. The primary aim of the study is to develop a deeper understanding about the effects of new computer education curriculum on the basic education school computer teachers and students, and their perceptions about the effectiveness of the new curriculum. The second aim is to criticize the main barriers and enablers in computer education by comparing the policy of computer education with the existing school practice.

In this study, a mixed method research approach including both quantitative and qualitative traditions is employed as the primary research method of the study. A mixed method approach is followed based upon a quantitative method to explore the perceptions of computer teachers and a follow-up qualitative method including

document analysis to confirm and complement the quantitative findings. By using both qualitative and quantitative data collection and analysis techniques, it was aimed to answer the research questions sufficiently in a single study and enhance the reliability and validity of the research results.

In this study, firstly, quantitative data was collected by using a questionnaire as a preliminary analysis of computer teachers' perceptions regarding new computer education curriculum. Secondly, qualitative data was collected and analyzed to explain and refine the results obtained through quantitative data in the first phase. In addition to the open-ended items in the questionnaire, qualitative data was obtained from the messages posted by computer teachers in online asynchronous discussion forums about the problems they encounter in their profession; and through newspapers about computer education and the occupational problems of computer teachers.

The results of the present study reveal that with the introduction of new computer education curriculum, many problems have emerged in the actual implementations of computer education courses in basic education schools. The most important of these problems are results of the elective status of computer education course and the limited time allocated for this course.

Keywords: Computer education in basic education schools, computer education curriculum, computer teachers, computer teachers' perceptions towards computer education course

ÖZ

TÜRKİYE'DEKİ İLKÖĞRETİM OKULLARINDA BİLGİSAYAR EĞİTİMİ: TEORİ VE UYGULAMADAKİ FARKLILIKLAR

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Bu çalışmanın amacı; Türkiye'deki ilköğretim okullarında görev yapan bilgisayar öğretmenlerinin 2006 yılında yenilen ilköğretim bilgisayar dersi müfredatına karşı olan tutumlarını değerlendirmek ve bilgisayar dersinin yenilen müfredatının ilköğretim okullarında nasıl uygulandığını göstermektir. Bu çalışmadaki öncelikli amaç; yenilenen ilköğretim bilgisayar dersi müfredatının bilgisayar öğretmenleri ve öğrenciler üzerinde olan etkilerini göstermek, yenilenen müfredata karşı öğretmen ve öğrenci tutumlarını araştırmak ve bilgisayar eğitimindeki temel faktörleri açıklayarak yenilen müfredat kapsamında yapılması gerekenler ile ilköğretim okullarındaki bilgisayar dersinin uygulanışının mevcut durumunu karşılaştırmaktır.

Bu çalışmada, çalışmanın amacına ulaşabilmek için nitel ve nicel yöntemleri içeren karma araştırma yöntemi kullanılmıştır. Karma araştırma yöntemi kapsamında, çalışmada ilk olarak bilgisayar öğretmenlerinin tutumlarını

değerlendirmek amacıyla nicel yöntemler kullanılmış; daha sonra da nicel yöntemlerle elde edilen verileri desteklemek amacıyla doküman analizini de içeren nitel yöntemlere yer verilmiştir. Bu çalışmada nitel ve nicel yöntemlerin bir arada kullanılmasındaki amaç çalışmanın amacına tam anlamıyla ulaşabilmek ve çalışmanın güvenirliliğini ve geçerliliğini artırmaktır.

Bu çalışma kapsamında, öncelikli olarak bilgisayar öğretmenlerinin yenilenen ilköğretim bilgisayar dersi müfredatına karşı olan algı ve tutumları hakkındaki nicel verilerin toplanması amacıyla bir anket uygulanmıştır. Daha sonra, nicel verileri açıklamak ve bu verilerde gerekli düzeltmeleri yapmak amacıyla nitel yöntemlere başvurulmuştur. Nitel verileri toplamak amacıyla, ankette yer alan açık uçlu sorulara verilen cevapların analizinin yanı sıra, bilgisayar öğretmenlerinin internet ortamındaki iletişim forumlarına mesleki yaşamlarında karşılaştıkları zorluklar ve bilgisayar eğitimi ile ilgili yazdıkları mesajların içeriklerinin analizi ve bu konulardaki internet ve gazete haberlerinin analizi yapılmıştır.

Araştırmanın sonuçları, yenilenen ilköğretim bilgisayar dersi müfredatının, bilgisayar dersinin ilköğretim okullarındaki uygulanışında birçok problemi beraberinde getirdiğini göstermektedir. Bilgisayar eğitimi sırasında karşılaşılan en önemli problemlerin temel kaynağı bilgisayar dersinin seçmeli bir ders olması ve bu ders için ayrılan kısıtlı süredir. Bu durum göz önüne alındığında; Milli Eğitim Bakanlığı'nın yeni bir öğretim programı geliştirerek bilgisayar eğitimini daha verimli yapma çabalarına ulaşıp ulaşmadığı açık değildir.

Anahtar Kelimeler: İlköğretim okullarında bilgisayar eğitimi, bilgisayar dersi öğretim programı, bilgisayar öğretmenleri, bilgisayar öğretmenlerinin bilgisayar dersine karşı algıları

To my amazingly supportive and wonderful family

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LIST OF ABBREVIATIONS

#	**:** Number
%	**:** Percent sign
ANOVA	**:** Analysis of variance
BEP	**:** Basic Education Program
DV	**:** Dependent variable
EĞİTEK	**:** General Directorate of Educational Technologies
EURYDICE	**:** The Information Network on Education in Europe
HEC	**:** Higher Education Council (YÖK)
F	**:** Frequency
ICT	**:** Information and Communication Technologies
ISTE	**:** International Society for Technology in Education
IT	**:** Information Technology
IV	**:** Independent variable
K-8	**:** Kindergarten through the eighth grade
K-12	**:** Kindergarten through the twelfth grade
M	**:** Mean
MoNE	**:** Ministry of National Education of Turkey
OECD	**:** Organization for Economic Co-operation and Development
PCAST	**:** President's Committee of Advisors on Science and Technology
SD	**:** Standard deviation
SPSS	**:** Statistical Package for the Social Sciences
TTKB	**:** Educational Board of Turkey
UNESCO	**:** United Nations Educational, Scientific and Cultural Organization
USDE	**:** United States Department of Education

CHAPTER 1

INTRODUCTION

This chapter reveals the justification for the present study by presenting the background of the study, statement of the problem, purpose of the study, research questions, assumptions of the study, and the role of the researcher. Finally, definitions of the terms and the concepts used in the study are presented at the end of the chapter.

1.1. Background of the Study

1.1.1. Technology Integration in Education

Educational systems of many countries around the world have faced important challenges since the beginning of the 21st century; such as large numbers of people to educate, insufficient economic conditions and low quality of education. Educational systems have tried to overcome and meet these challenges by developing new strategies, one of which is the integration of Information and Communications Technologies (ICT) into education (Lever-Duffy, McDonald & Mizell, 2003; USDE, 2000, as cited in Göktaş, 2006).

Parker (1997) and Akkoyunlu (2002) contended that rapid developments in ICT have brought about drastic changes in every field of life; and undoubtedly, educational system is not an exception. A quite large body of literature supports

the idea that advances in information and communication technologies makes the incorporation of technology into educational systems inescapable, and ICT has a critical role in enhancing the quality of education (Akkoyunlu, 2002, 2006; Çakır, 2008; Göktaş, 2003, 2006; ICT League Paper, 2002; OECD, 2001; Sinko & Lehtine, 1999; SchoolNet Africa, 2004; The Independent ICT in School Commission, 1997; Yıldırım, 1999, 2007). For example, Yıldırım (1999) points out that information and its technologies dominate the 21st century, and because of their tremendous impact to enhance teaching/learning process, information technologies, especially computers, play an essential role in education.

The rapid developments in instructional technologies have created the "information society", in which knowledge has become a key factor for development in every field of society; and it is obvious that technology plays a crucial role in assisting the educational progress of countries (Akkoyunlu, 2002). This situation leads to the need to become aware of the changes in educational technology, and the need to adapt to these changes to function effectively in every field of education (Akkoyunlu, 2002; Parker, 1997). Needless to say, it is obvious that advancements in educational technologies change the educational requirements and learning needs of people, and make it unavoidable to integrate ICT into the educational system to create effective learning and teaching environments (Akkoyunlu, 2002). Therefore, because of the changing needs of learners as results of the advancements of information technology, students of information age must be prepared to have necessary education and skills to compete in the rapidly changing and technology dominated the 21st century (Yıldırım, 1999).

1.1.2. ICT Integration in the Turkish Educational System

Parallel to the developments in information technologies and the efforts of other countries around the world to integrate ICT into their educational systems, Turkey has begun to make some commitments to support and accelerate the acquisition of the 21st century knowledge and skills. In order to achieve this purpose, Turkey has

begun to provide new educational opportunities and has made efforts to integrate ICT in its educational system (Schware & Jaramillo, 1998).

In Turkey, although the Ministry of National Education (MoNE) has taken it seriously to use educational technologies in schools since 1930s, the first attempts to implement ICT projects in the educational systems started in 1984, in which computers came into use in the Turkish Educational System (Akkoyunlu, 2002). As a dynamic example of these projects, in 1992, "a special unit was created within the General Directorate of Computer Education and Services (BILGEM) to take responsibility for the Computer Experimental Schools (CES) Project" (Schware & Jaramillo, 1998, p.1). The purpose of this project was to explore how computer-based education can improve the teaching and learning processes (Schware & Jaramillo, 1998). In addition, with the establishment of BİLGEM and the CES Project, "it aimed to integrate instructional technologies into schools by using computers at every level of schooling, training the teachers, and improving computer based education" (Akkoyunlu, 2002, p.170).

Since 1998, the number of similar projects has increased to integrate ICT in all levels of educational system in Turkey by providing instructional technology rooms in all basic education schools (Akbaba-Altun, 2004; Göktaş, Yıldırım, & Yıldırım, 2008). To facilitate these development projects, in 1998, MoNE has received a loan, which was equivalent to 600 million US Dollars from the World Bank to invest in a National Basic Education Program (BEP), which could be described as the action program to apply Turkey's new educational strategy in ICT. As a comprehensive educational investment program, the objectives of the BEP are to expand the eight-year compulsory basic education coverage –which was formerly five years–, to improve the quality in basic education, and to make basic education schools become learning centers of the community (Akbaba-Altun, 2004; ECSHD, 1998).

In order to improve the quality of education in Turkey, one of the objectives is to ensure that each student and teacher becomes at least computer literate and is

efficient in using information technologies in education. Therefore, MoNE opened information technology (IT) classrooms in elementary schools (K-8), which included computers, printers, scanners, TVs, videos, CDs and slides to be used for each separate course. This phase, which is called the first phase of the BEP, was completed at the end of 2000 (Akbaba-Altun, 2004; ECSHD, 1998; Göktaş & Yıldırım, 2007; Göktaş et al., 2008; MoNE, 2001). With the successful implementation of the BEP Phase I, the second phase of the program, which is called BEP Phase II, was prepared for implementation throughout the whole country.

While implementing the development projects to integrate ICT in all level of the educational system, MoNE also monitored the program activities in compliance with the basic components defined within the program. After the first phase, in 2002, MoNE decided to put the second phase in action to support the same goals of the first phase activities including covering all schools to be equipped with information technology classrooms (Akbaba-Altun, 2004; MoNE, 2003b, 2005, 2006; World Bank, 2002, 2008). However, while the MoNE was planning to implement the second phase of BEP, and in this way, to increase the use of information and communications technologies by almost all teachers and students, and to make computer education more common in schools; it has overlooked the fact that making some political decisions is not enough to improve the quality of education in general, and that of the computer education in particular, without considering the actual implementations of policies in schools. As Göktaş et al. (2008) point out that for effective ICT integration in educational system, a variety of factors such as society, policy, school, teacher and student, which affect the ICT integration in practice, need to be considered.

1.2. Significance of the Study

One of the most important reasons for the Ministry of National Education (MoNE) to implement the Basic Education Program was to ensure that each student and teacher become at least literate in Information and Communication

Technology (ICT) (Akbaba-Altun, 2004, 2006; ECSHD, 1998; MoNE, 2001). However, the success of this initiative in ICT has been highly dependent upon the actual implementation of this program in schools. A research study conducted by Akbaba-Altun (2006) has suggested that in spite of the large financial investments in ICTs made by the MoNE, the IT classrooms are not used effectively. In the same research study, Akbaba-Altun (2006) also has stated that it was obvious from the regulations (Reg. No: 13) of the MoNE, IT classrooms are not being used effectively (MoNE, 2002).

Considering all of these facts, it is seen that because of the continual large financial investment into ICTs, the question of how those IT classrooms can be used more effectively becomes extremely vital (Akbaba-Altun, 2006). One of the possible solutions to existing problems related to these issues may be a well-planed and implemented computer education provided to the students in basic education schools throughout the whole country. However, when providing students with computer education in schools; many factors should be considered, one of which is the curriculum design and development. Akbaba-Altun (2006), in one of her researches, points out that curriculum is an important issue both at the development and implementation levels of computer education as well as instructional technology integration in schools. The participants in her research related to integration of IT in schools, who are the computer coordinators and supervisors, claim that students' needs are not analyzed well during curriculum development. Hence, the computer education curriculum content overlaps among grades, causing the lack of motivation and interest of students. This also brings up another issue for computer teachers at the implementation level, since they teach the same content over the years to the same students. The following statements summarize what computer coordinators and supervisors see as problems (Akbaba-Altun, 2006):

- The needs of students were not considered and analyzed thoroughly

- The content for 4th, 5th, 6th, 7th, and 8th grades is almost identical. Since computer teachers need to keep up with the official curriculum, they find themselves repeating the same thing every year with the same students
- The curriculum should be redesigned, because the framework is the same for 4th graders and 8th graders

According to the results of the Akbaba-Altun's research (2006), as mentioned above, it is seen that curriculum development plays a crucial role in the effectiveness of computer education provided in schools. Considering all of these problems, the MoNE developed a new computer education curriculum in 2006. By developing this new computer education curriculum, the MoNE has intended to make computer education and integration of technology in schools more common and effective. However, developing a new curriculum has not solved the existing problems; in contrast, the implementation of it in schools has appeared to generate new problems in addition to the existing ones. With the introduction of the new computer education curriculum in basic education schools in 2006, MoNE has decreased the length of computer education course in schools from two hours a week to one hour a week. In addition, computer education course has been considered as an elective course, which means computer teachers have been required to evaluate students' performance without grading. As a result of these changes, computer teachers have faced many problems to overcome. Based on the experiences and the observations of the researcher as a computer teacher, some of these problems can be listed as follow:

- Because of assessing students' performance without grading, students' attitudes toward computer education have changed adversely. They began to think that computer education is not as important as the other compulsory courses like mathematics or science education.
- Students' motivation toward and interest in computer education have been decreased.

- Because of the limited time allocated to computer education course (one hour a week), working hours of computer teachers have been halved, and they are required to involve in more technical works in school in their spare time, which cause the role-conflict for computer teachers.
- Students are not able to practice enough what they have learned because of the limited time period allocated to computer education. So, their learning in computer education is limited to the theoretical knowledge which can be easily forgotten without making enough hands-on practice on computers.

Considering this situation, it seems vital to pose the question of whether or not the MoNE has reached to its aim of making computer education more effective by developing a new computer education curriculum. In other words, whether or not the designed policy in computer education has a parallelism with its actual implementation in schools is not clear.

This study will contribute to understand how computer teachers feel about the changes made within the new computer education curriculum and how this situation affects their professional life. In other words; this study will contribute to understand (1) what is really going on in the context of computer education courses in schools, (2) how computer teachers and students perceive the new curriculum, (3) which problems they face, and (4) what should be done in order to overcome the existing problems. In this way, this study will provide a guideline for the policy makers to make some changes in order to make computer education more effective by taking into consideration the ideas of the actual implementers (teachers and students) of the policies in schools. In other words; the results of this study can be used by the legislators, politicians, policy makers and the MoNE to review the current status of computer education and revise the related policies and strategies to improve the existing situation of computer education in basic education schools.

1.3. Purpose of the Study

In Turkey, the Ministry of National Education (MoNE), realizing the big impact of computer technology on education, decided to introduce computer education into the Turkish Educational System in 1994. Upon taking this decision, the MoNE has begun to develop policies and new strategies to integrate computer education in schools. After these initial attempts to plan and develop new strategies, the MoNE introduced computer education in primary schools in 1998-1999 school year (MoNE, 1998). In these early years, computer education was implemented only in schools which had an established computer lab ready to use. These early policies and strategies of the MoNE were implemented in schools until the 2006-2007 school year. Parallel to the new advancements in computer technology, the MoNE has realized that it should review and revise the strategies and polices on computer education; and in 2006, the MoNE developed new policies on computer education in basic education schools and designed a new computer education curriculum (TTKB, Reg. No: 347, 2006a; TTKB, 2006b). With this new initiation, the MoNE planned to improve the computer education and to solve the existing problems in this area.

The purpose of this study is to investigate the current status of computer education in Turkish basic education schools by exploring the perceptions of the computer teachers in terms of the policy of new computer education curriculum, which was developed in 2006, and its actual implementations in schools. This study is mainly concerned with developing a deeper understanding about the effects of new computer education curriculum on the basic education school computer teachers and students, their perceptions about the effectiveness of the new curriculum, and the main barriers and enablers in computer education by comparing the policy of computer education with the existing school practice.

1.4. Assumptions of the Study

In this study, the following assumptions are adopted:

(1) The researcher has assumed that there is a gap between the policy and the actual implementation of the computer education in basic education schools; and all the computer teachers have some ideas and beliefs to explain this situation.

(2) The researcher has assumed that all participants responded accurately to all measures used in the study.

(3) The data were accurately recorded and analyzed to reach reliable, accurate and valid conclusions.

(4) All measures used in the study have accurate enough reliability and validity values to allow accurate assumptions.

1.5. The Role of the Researcher

The major roles of the researcher and the tasks completed in this study can be listed as in the following section:

(1) The researcher was objective as much as possible throughout the whole study in order to reach accurate, reliable and valid conclusions.

(2) A survey instrument (questionnaire) was developed by the researcher based on the related literature as well as the own experiences and observations of the researcher in computer teaching.

(3) The questionnaires were distributed to volunteer computer teachers and collected through the online forums and electronic mails.

(4) The discussion messages posted by computer teachers, which were related to their job-related problems, to the various online forums were collected and examined.

(5) The quantitative data collected throughout the study were coded, entered in SPSS software, analyzed, interpreted and discussed by the researcher.

(6) The qualitative data were coded, categorized, analyzed, interpreted and discussed by the researcher.

1.6. Definitions of the Terms and Concepts Used In the Study

Computer Education Course

The course which is designed to provide the students in basic education schools with necessary knowledge and skills in using information and communication technologies, especially the computers and the Internet, in every field of life effectively. Computer education course is designed by the "Educational Board of Turkey" - Talim ve Terbiye Kurulu Başkanlığı (TTKB) - under the supervision of the Ministry of National Education (MoNE), and it is provided to the students from the 1st grade level until the 8th grade level in Turkey both in public and private basic education schools. The goal of the computer education course is to help students gain necessary knowledge and skills in using information and communication technologies in order to keep pace with the information age.

Computer Literacy

Computer literacy can be defined for the scope of this study as to have basic knowledge and skills that enable one to confidently deal with computer technology in their daily life (Tsai & Tsai, 2003). Computer literacy does not mean having an understanding of how computers work (digitally); rather, it means being familiar with computer technology and having basic knowledge and skills to use this technology effectively and confidently.

Computer Teacher

A person who is working in public (state) or private basic education schools and who is responsible primarily for teaching computer education courses to the

students at grade level from 1 to 8 in these schools. A computer teacher has graduated from the teacher training programs of computer education departments in faculties of education like the department of "Computer Education and Instructional Technology"; and s/he has been appointed in a basic education school by the Ministry of National Education after graduation.

ICT

ICT, which stands for "Information and Communication Technologies", can be defined broadly as "a diverse set of technological tools and resources used to communicate, and to create, disseminate, store and manage information" (Blurton, 2002). In other words, as Ceyhun & Çağlayan (1997) state, ICT enables the collection and the processing of information, store and transfer this information to somewhere else, and retrieve them remotely when needed by means of electronics and/or other technologies (as cited in Göktaş, 2006).

ICT Integration

Information and Communication Technologies (ICT) integration in education can be defined as using ICT in all levels of education effectively and efficiently by all stakeholders especially by teachers and students (Göktaş, 2006). In other words, ICT integration can be defined as a process of using any ICT tool (computers, Internet, multimedia programs on CDs, and etc.) to enhance student learning and teaching process (Wang & Woo, 2007).

Motivation

Motivation can be broadly defined in educational terms as a learner's personal (intrinsic) or external (extrinsic) reasons for learning (Francis, Mulder & Stark, 1995). Motivation can be defined for the scope of this study as the willingness and the desire of the students to achieve the goals of computer education course. A motivated student in computer education course can be defined as the one who:

- has positive attitudes toward computers and computer education course,
- has low anxiety toward using and learning computers,
- is interested in learning the subjects within the context of the computer education,
- keeps up with the assignments and the tasks of the computer education course,
- enjoys learning and using computer technology

CHAPTER 2

REVIEW OF LITERATURE

2.1. Introduction

This study focuses on the investigation of the current status of computer education in the Turkish Basic Education Schools by exploring the perceptions of the computer teachers in terms of the new computer education curriculum, which was developed in 2006. This part of the study explains the related literature regarding the purpose of the study. For this study, three types of sources were searched: (1) general sources (e.g. abstracts and indexes), (2) primary sources (e.g. journals), and (3) secondary sources (e.g. textbooks) (Fraenkel & Wallen, 2006).

The following part provides a discussion of related literature in order to provide background information for this study by presenting the ideas related to the research questions as: (1) ICT in education, (2) factors affecting ICT integration in education, (3) integration of ICT into the Turkish Educational System, (4) introduction of computers into the Turkish Educational System, (5) a review of computer education in Turkey, and (6) training of computer teachers.

2.2. Information and Communication Technologies in Education

The term Information and Communications Technology (ICT) implies all technologies used for information processing and communicating. In fact, in most countries, technology and educational technology are used instead; and it appears

that ICT has replaced these two terms because of a rapid transition towards a knowledge and information society. In most educational settings, ICT means computer technology, and especially the Internet, as a result of rapidly evolving integration of computers into the educational systems (Voogt & Knezek, 2008). ISTE (1999) implies the definition of ICT as using computers and other information technologies to aid teaching and learning process. Therefore, ICT can be referred as using, at least, computers and the Internet (Göktaş, 2006). ICT includes computer hardware and software, and a host of devices to convert information (text, images, sounds, motion) into common digital formats. However, ICT should not be taken as solely hardware, but also as a way to use information effectively to increase human capabilities (ISTE, 1999).

ICT have gained increasing attention and significance in the past twenty-five years. The availability of enormous amounts of information sources through Internet, the technological advancements in ICT sector, and an increasing flexibility in organizations and enterprises have increased the speed and rate of information and knowledge growth in the world (Adelsberger, Collis & Pawlowski, 2002). Since the early times of ICT, it has had a large impact upon almost every aspect of society and daily life including the values, attitudes, conventions, economic and industrial structures and practices, and particularly education and training. In fact, the role of ICT in educational area is a part of a wider picture of the impacts of ICT upon societies around the world; and societies see the integration of ICT into education and training as a bridge between the present and society's future health, wealth and relative prosperity (La Velle & Nichol, 2000).

From the beginning of the 21st century, many countries in the world have faced many problems in the field of education including insufficient economic conditions to provide quality education, traditional ways of instruction proven to be inefficient to educate people, and etc. As a result of this situation, educational policymakers in these countries began to look for new alternatives to provide high quality education and to educate people in the most cost-effective way. Taking

into consideration the demands of the information age, many countries have decided that the most effective way to overcome the challenges faced in educational systems is to integrate ICT into education. Since the beginning of the information age, the importance of ICT in educational environments has increased notably because of its crucial role in enhancing the quality of education and the effectiveness of learning process in schools. Today, almost all countries in the world are making large investments to equip their schools with ICT with an intention to improve the student achievement and to keep pace with the information age (Göktaş, 2006).

According to the report of SchoolNet Africa (2004), ICT has become an increasingly integral part of modern life; and in order to equip young people with skills and knowledge to cope with technology, it is crucial to use ICT in teaching and learning process in schools. Similarly, Sinko and Lehtinen (1999) point out that with the new millennium, ICT plays an increasingly central role in almost all future planning of schools and instruction.

Göktaş (2006), based on the documents of ICT League Paper (2002) and OECD (2001), has mentioned three main rationales to integrate ICT into education. He defines these three rationales as the following:

> The first rationale is economic. Many areas of employment require having personnel with ICT skills. In this century, knowledge of and familiarity with ICT are important factors of employability. Education should meet the demands of a changing economy and prepare future workers. Thus, ICT is a necessary aspect of economic perspective. Those who have not developed awareness of ICT will be at great economic disadvantage in the new information era.
>
> The second rationale is sociological. It focuses on familiarity with ICT becoming a requirement for participation in society. Capability using ICT is seen as an essential "life skill" in the same way as literacy and numeracy, so much so that the range of skills and processes supported by ICT is brought together in the nation of digital literacy, which becomes both a requirement and a right for all learners. ICT also can provide people with learning difficulties and/or physical handicaps, better opportunities to study and improve quality of life conditions. Since ICT

> is instrumental in creating flexible and user compatible training arrangements, it can help to create equal opportunities for competence development regardless of gender, geographical location, social situation, illness or other circumstances.
>
> The last rationale is pedagogical. It concentrates on the role of ICT in teaching and learning. The potential for this role has developed rapidly and dramatically with advances in ICT. It has the ability to increase the breadth and richness of learning. The learning process could be made more attractive and more effective through a well balanced and integrated use of ICT tools. ICT can improve the quality of the learning process and motivate students. ICT can provide rich learning environments challenging students to change their attitudes, requiring them to assume more responsibility for their learning, using inquiry, collaborative, technological, and problem solving skills. ICT is an important factor to help build students' self-esteem, empowering and enabling them as well as building confidence and feelings of success. Consequently, ICT can improve quality of learning. It is also seen as helpful in making the education system more effective and more flexible. In order to face new challenges, the education system must adopt new methods, develop new content, new ways of delivering education, other organization models, and methods of collaboration. The countries here use ICT as a catalyst for change and the development of new roles for students, and teachers. Many countries are involved in major educational reforms in which ICT plays an important, if not leading, role. Therefore, it is a catalyst for change. (Göktaş, 2006, pp. 16-17)

Similar to the above rationales to integrate ICT into education, the report of The Independent ICT in School Commission (1997), defines the role of ICT in education. According to this report:

> ICT is in no sense a substitute for "traditional" learning and teaching. Nor is it a substitute for students using their minds and imaginations. The role of ICT is to serve education: in particular by helping students to learn more effectively and by helping teachers to do their professional job.
>
> Attempts are sometimes made to suggest that ICT is in some way the property of a particular educational philosophy.… The best analogue we have heard for ICT is the analogue with the invention of electricity. Electricity - once regarded as a strange, almost frightening wonder of the age - has come to serve almost every aspect of society. So also with ICT. It should be used in the service of the curriculum, and made available to

> help teachers to manage the learning process; however that is defined by them. (The Independent ICT in School Commission, 1997, p.15)

In the same report, it is stated that there are a number of features of ICT, which makes it particularly suitable for education. Firstly, ICT combines and integrates full range of media (e.g. sound, vision, text, and numeric data) which brings out successful learning. Another feature is that, ICT provides teachers with opportunities and options that they have never had before. Finally, through ICT, teachers can retain interest and involvement of students for longer periods of time, which is much harder without using ICT (The Independent ICT in School Commission, 1997).

Hepp, Hinostroza, Laval, and Rehbein (2004) underline that although ICT have been used by education ever since their inception; they have been massively integrated into education only since early 1980s. The authors state that many countries around the world invest in ICT to improve and update the education they provide for their younger generations. Hepp et al. (2004) indicate that there is no universal truth for applying ICT in education without considering the each country's own realities, and there is no breakthrough on improving learning achievements with ICT. However, on the other side of spectrum, the authors underline the importance of ICT in education by explaining the reasoning for ICT integration into education. According to Hepp et al. (2004), there are three main rationales for integrating ICT into the educational systems of the countries around the world.

The first rationale is related to the needs of the societies to acquire new skills. Today, ICT are the pre-eminent tools for information processing; and they increasingly pervade every aspect of life including work, learning, leisure and health. As a result, new generations have to become competent in the use of ICT, and they should acquire the necessary skills. Therefore, in order to enable new generations to have access to such ICT resources as computers and networks

during their school life, ICT should be integrated into the educational systems of the countries.

The second rationale is related to the productivity enhancement of the countries. Needless to say, schools are the information and knowledge handling institutions of the societies. Hence, ICT should be made use of as the fundamental management tools at all levels of the educational systems from classrooms to ministries.

According to Hepp et al. (2004), the third rationale is based on the quest for quality learning. In the information age, schools should profoundly revise present teaching and learning methods and resources in order to create more effective learning environments and to help their students improve life-long learning skills and habits. In this purpose, ICT are considered as versatile and powerful tools; and therefore, they should be used in each classroom, library and teacher room. However, it should be taken into consideration that; although ICT have promises with great potential, so far they have not provided any large-scale breakthrough in learning improvements.

Besides, one of the studies held in Turkey by Yıldırım (2007) underlines the importance of ICT usage in education. In this study, Yıldırım (2007) emphasizes that ICT plays an important role in the economical growth and social wealth in the information society. In this respect, educational institutions all around the world have been undergoing fundamental changes to meet the demands of the knowledge in the society and ICT has been functioning as a catalyst for this educational reform.

Pelgrum (2001) points out that, since the late 1990's, many governments have developed plans to intensify their investments regarding ICT in education. According to documents of ICT League Paper (2002), most countries around the world legitimize a high priority in policymaking and spending of considerable amounts of money to integrate ICT into their educational system. It is worthy to

note that ICT in education requires educational and socio-economical policy plans concerning the life-long learning concepts, new key skills, information handling skills, and new education concepts where traditional roles of teachers and students change. In the documents of World Bank (2005), it is stated that the emphasis placed on developing an ICT policy varies from one country to another. Although some countries have preferred to initiate ICT usage in schools and train teachers without an ICT policy in education; other countries have found it important to have a policy, which serves as a framework and guide for ICT use in education.

Pelgrum (2001) states that ICT in education is an area which is in a constant turmoil. In addition, in the process of integration of ICT into education, many participants play a role, and many forces may be influential in bringing about changes that are beyond the direct control of authorities. Therefore, it is crucial to periodically assess the actual situation of ICT in educational practice, while taking decisions regarding ICT integration into education.

As mentioned in the documents of World Bank (2005), sometimes integrating ICT in education may sound as simply distributing computers, learning software and other ICT materials like audio-visual aids. In addition, ICT is merely attached to the existing teaching and learning activities without making any chances in the traditional curriculum; and teaching strategies and learning activities remain almost intact. When integrating ICT in education, the learning medium changes from the traditional such materials as textbooks to web-based books, Internet or some educational software; but, in most situations, the learning paradigm remains the same and ICT are not used as an effective learning and teaching tool. Therefore, before making any investments for ICT integration, it is crucial to take some factors into consideration in order to optimize the educational potential of ICT (World Bank, 2005).

Based on the previous discussion, it is undeniable that ICT have a paramount role in the field of education. All countries in the world have to integrate ICT into their educational system by involving in educational reforms in which the ICT has a

major role. Only in this way, most countries may face the demands and the challenges of the information age. However, it should be taken into consideration that, as Hepp et al. (2004) stated, "there is no universal truth when it comes to applying ICT in education, and that there is no advice that can be directly applied without considering each country's reality, priorities and long-term budgetary prospects and commitment" (p.v). "Given the high investment costs required to introduce ICTs into schools, it is important for countries to learn from the experience of others to make good decisions and to avoid repeating the errors of others or losing opportunities" (World Bank, 2004, p.2).

2.3. Factors Affecting ICT Integration in Education

2.3.1. Main Barriers for ICT Integration in Education

In the 21st century, rapid developments in information and communication technologies (ICT) have created information societies, which results in drastic changes in the way the world operates and communicates. Needless to say, this situation has had a big impact on educational systems of many countries around the world, both in terms of the content and the educational services (UNESCO, 2003). At the same time, information societies require individuals who are independently and creatively thinking, solving problems, and managing their learning process in a proper way (Yalın, Karadeniz, Şahin, 2007).

Faced with this situation, policy makers have realized that in order to prepare individuals for the demands of the 21st century, ICT should be effectively integrated into educational system by providing schools with computers and training teachers for using them in their teaching process (UNESCO, 2003; Yalın et al., 2007). However; as Yalın et al. (2007) stated, integration of ICT is not as simple, "but integration means unification as a whole" (p.1). Earle (2002) is more expressive in this respect and he points out that "integration does not just mean placement of hardware in classrooms" (p.6). UNESCO (2003) indicates that "simply providing access to ICT is not going to radically change education

systems for the better; an overall view of what education should be seeking to achieve is needed in order for ICT to be utilized to their full potential within education systems" (p.1). Furthermore, UNESCO (2008) points out that providing educational environments with only ICT equipments does not automatically enhance teaching-learning process, and much depends on how ICT are used in educational activities; and it states that "acquiring the technologies themselves, no matter how hard and expensive, may be the easiest and cheapest step in a series of steps towards utilizing these technologies to improve; it is the integration of these technologies into education systems that is proving most difficult" (p.1).

Based on these kinds of arguments, it is obvious that integration of ICT into education is a process of using ICT effectively and efficiently in all dimensions by providing necessary infrastructure, teaching-learning environments and teaching programs (Earle, 2002; Yalın et al., 2007). In spite of the fact that ICT have a great potential for enhancing education through facilitating the fulfillment of educational objectives and making them more affordable (UNESCO, 2008); the current situation of integrating ICT in education is a struggle all around the world; and many barriers for effective integration of ICT into education exist (Göktaş, 2006).

Bromme, Hesse, and Spada (2005) described a barrier as "it comes from psychological research on problem solving and creativity. There it refers to the gap between an initial and end state. In other words, barriers are challenges which have to be overcome in order to attain a goal" (p.1). The authors also point out that it has become apparent that the localization of difficulties depends on theoretically based assumptions concerning the nature of barriers. Working with ICT is often difficult, simply because they are new, and because individual routines and social routines have to be established in using them. In addition, the use of ICT is difficult because they are not just alternative tools for dealing with old conventional problems but they are also expected to help with meeting new challenges (Bromme et al., 2005).

Many educators agree that integrating ICT into education plays a crucial role in providing rich teaching and learning environments. The ultimate goal of integrating ICT is that students could use technology with the same ease which they use books, maps, pencils and pens. However, this is not as easy, and putting technology into schools is only a part of the task (Çakır, 2008). Researchers identify many barriers in the integration of ICT such as limited equipment, access, time, training; teachers' preferences to use traditional methods; and teachers' beliefs and attitudes towards teaching and learning with technology. There is a large body of research that identifies the barriers affecting ICT integration process (Ertmer, 1999; European Schoolnet, 2006; European Schoolnet, Balanskat, Blamire, 2007; Hew & Brush, 2007; Lawson & Comber, 1999; Mumtaz, 2000; Pelgrum, 2001; Williams, Coles, Wilson, Richardson and Tuson, 2000; USDE, 2000).

Lawson and Comber (1999) describe ICT as a different and potentially transformative technology for schools, and they stated that the most effective factors, which affect the successful integration of ICT into schools, are: (1) attitudes of teachers towards innovation, (2) the role of ICT coordinator, (3) the attitude of senior management and support of the administrators, and (4) lack of adequate support and training. A noteworthy finding of the authors is that teachers themselves are often identified as a main barrier for the successful integration of ICT in schools. Because of their fear of technology or lack of skills and understanding how ICT can improve teaching-learning process, many teachers have problems in adapting to the use of ICT in their work (Lawson & Comber, 1999). Furthermore, ICT presents a challenge for the traditional role of teachers as a provider of information, and requires them to be a guide for the pupils in the process of acquiring and understanding information available via the new technologies (Davis, 1995, as cited in Lawson & Comber, 1999).

According to Williams et al. (2000); barriers for integrating ICT into teaching-learning process are: (1) lack of knowledge and skills of teachers to use ICT as a core teaching resource, (2) lack of access/availability of ICT resources both in

terms of hardware and software, (3) lack of ongoing support and advice to encourage integration of ICT beyond any formal training, and (4) access to the technology.

In a similar study, Pelgrum (2001) also studied the barriers that impede the integration of ICT. As a result of the study held in 26 countries, it has been found that the most effective factor faced during the integration of ICT into education is the insufficient number of computers in educational environments. This problem also includes insufficient peripherals and not enough copies of software. As the second barrier, Pelgrum (2001) points out that teachers do not have sufficient knowledge and skills regarding the use of ICT. In the same study, it is stated that most countries do not succeed in providing sufficient facilities to keep teachers up-to-date with regard to new technologies; and it is proposed that "educational innovations usually do not succeed if teachers are not provided with the skills and knowledge related needed to carry them out. Training teachers is a very expensive activity and hence, often much neglected in large-scale innovations" (p.165). Other barriers are defined as the difficulty to integrate ICT in instruction, scheduling enough computer time for students, insufficient teacher time, and the lack of supervisory technical staff (Pelgrum, 2001; Pelgrum & Law, 2003).

Hew and Brush (2007) also stated the barriers for effective ICT integration into education. The authors identified 123 barriers, which are faced during technology integration into teaching-learning processes at K-12 level, from the review and meta-analysis of 48 past empirical studies. They classified these general barriers into six main categories: (1) resources, (2) knowledge and skills, (3) institution, (4) attitudes and beliefs, (5) assessment, and (6) subject culture. They found that ICT integration is directly influenced by attitudes and beliefs of teachers towards technology; lack of specific technology knowledge and skills; lack of technology supported pedagogical knowledge and skills; lack of technology related classroom management knowledge and skills; lack of leadership skills, time-tabling structure, and technology integration plan; lack of such resources as technology, access to available technology, time, and technical support.

According to Mumtaz (2000), there are three interlocking factors that affect the teachers' use of ICT in classroom. The first factor is the school as an institution providing teachers with little time to manage and familiarize themselves with ICT. The second is limited resources within schools, which are a great impediment for integration of ICT. Lack of computers and software in the classroom can seriously limit what teachers are able to do with ICT. The last is teacher factors involving beliefs about the way the subject should be taught and skills associated with competence in managing classroom activities and computer-handling technical skills, and attitudes and experiences of ICT.

Ertmer (1999) points out that many barriers ranging from personal fears of teachers to organizational and pedagogical concerns can affect the integration of ICT into teaching and learning process. Ertmer (1999) classifies the barriers as first order barriers including limited ICT equipment, training and support; and second order barriers which are internal barriers including teachers' deeply held beliefs about teacher-student roles; lack of skills for designing technology-enhanced curricular activities; and lack of skills for assessing students' learning in technology-based works. According to another study of Ertmer (2005), the rate of technology usage in education is surprisingly low although the conditions for successful technology integration have been constituted; including ready access to technology, increased training for teachers, and favorable policy environments. As a result of this situation, Ertmer (2005) suggests that there are many barriers affecting ICT integration, specifically related to pedagogical beliefs of teachers.

USDE (2000) indicated that certain characteristics of classrooms and schools, such as equipment, time and technical assistance; may act as barriers for ICT integration. USDE (2000) identified barriers to the use of computers and the Internet for instruction most frequently reported by public school teachers are: (1) not enough computers, (2) lack of release time for teachers to learn how to use computers or the Internet, and (3) lack of time in schedule for students to use computers in classroom.

Similar to the above barriers, the reports of European Schoolnet (2006) and European Schoolnet, Balanskat, Blamire (2007), which addressed the issue of ICT integration in European countries, identified barriers affecting ICT integration in three dimensions: (1) teacher-level barriers, (2) school-level barriers, and (3) system-level barriers. In terms of teacher-level barriers; lack of ICT skills and knowledge, low motivation in using new technologies, lack of confidence, and inappropriate teacher training constitutes a barrier for teachers to integrate ICT in teaching-learning processes. As for schools; the barriers include limited access to ICT due to a lack or poor organization of ICT resources, the absence or poor quality of ICT infrastructure, poor quality and inadequate maintenance of hardware, limited access to ICT equipment, and lack of suitable educational software. In addition, lack of project-related experiences concerning ICT planning and implementation, and absence of ICT mainstreaming into school strategies constitute an important barrier for schools. Finally, at the level of system; the rigid structure of the traditional schooling system, traditional assessment, restrictive curricula and restricted organizational structure constitute a barrier for integration of ICT into education (European Schoolnet, 2006; European Schoolnet et al., 2007).

In light of the aforementioned literature, it is obvious that integration of ICT into education is influenced by many barriers. UNESCO (2008) points out that "effectively integrating technologies into educational systems is a complicated process. The road from the potential that ICT offers to effective application is a long and sophisticated one that requires deliberate planning, sustained implementation, calculated course modification, and continuous maintenance" (p.2).

2.3.2. Possible Enablers for ICT Integration in Education

As stated earlier, integrating ICT in education is a struggle all around the world; and many barriers for effective integration of ICT into education exist (Göktaş, 2006). However, in spite of the various barriers for ICT integration, there are also

some factors which are effective in enabling and encouraging the integration and the use of ICT by students and teachers in teaching and learning process.

According to Ertmer, Addison, Lane, Ross, and Woods (1999), factors enabling ICT integration can be classified into two primary categories: (1) extrinsic (first-order), and (2) intrinsic (second-order). While extrinsic enablers include access to ICT hardware and quality software in teaching and learning environment, the Internet, technical support, and administrative and peer support; intrinsic enablers include personal beliefs about the role of technology in education, preexisting experience and success with technology, and self-efficacy.

Scrimshaw (2004) points out that although there are some barriers preventing the use of ICT in education, they are open to change; and some enabling factors may encourage the full use of ICT in educational environments. According to Scrimshaw (2004), there are two factors enabling ICT use in education. The author delineated these enabling factors as (1) individual factors including availability of high quality ICT resources, full access to software and hardware at all times, high level of technical support, availability of good quality staff training on ICT usage; and (2) school level enabling factors including school policies on using ICT across the curriculum, school leadership for enabling teachers to engage in innovative ICT practices, effective timetabling of rooms and equipment, access to resources, on-site technical support, and participation in national ICT developments, projects and initiatives.

In addition to above enabling factors, specifically, teachers have a crucial role in integrating ICT in educational environments. The success and effectiveness of ICT integration depend upon the beliefs and attitudes of teachers towards teaching and learning with technology, and their enthusiasm and motivation to integrate technology in education. There is a significant body of literature claiming that successful ICT integration depends on views of teachers (Altun, 1997; Becker, 1994; Ertmer, 1999, 2005; European Schoolnet, 2006; European Schoolnet et al.,

2007; Hew & Brush, 2007; Lawson & Comber, 1999; Mumtaz, 2000; Pierson, 2001; Sugar, 2002; Yıldırım, 2000, 2007).

Sugar (2002) points out that positive attitudes of teachers towards ICT integration are an important enabling factor. Sugar (2002) states that by changing the attitudes of teachers toward the use of technology in teaching and learning process, some barriers for effective ICT integration into education could be removed. Similarly, Mumtaz (2000) confirms that teacher factors including personal beliefs, skills, and attitudes to technology integration are influential in ICT usage in education. Mumtaz (2000) states that teachers who integrate technology in classroom activities more successfully are the ones who have positive attitudes towards ICT integration. According to Yıldırım (2007), teachers play the most important role in introducing novelties to the education systems; and they undertake a more vital role in the teaching and learning process today when compared to the past. Hence, attitudes of teachers towards technology and novelties shape the technology integration and adjustments, and effective usage of technology in schools.

2.4. ICT Integration in Turkey

2.4.1. ICT in Schools in Turkey

At the beginning of the 21st century, Turkey has faced many problems in the field of education including a great number of students to educate, poor economic conditions, and a very large centralized educational system. Considering all of these problems, the Turkey's educators and policy makers have tried to develop new alternatives and solutions to overcome these problems, and to make the Turkish Educational System better. One of the possible alternatives to improve the education in Turkey was the integration of ICT into educational system at all levels. Integration of ICT in education was seen as crucial for Turkey to keep pace with the information age (Göktaş, 2006).

Integration of ICT in Turkish Educational System, parallel to the international trend of increasing importance of ICT in education worldwide, was begun as early as 1984 (Akkoyunlu, 2002; Göktaş, 2006). In these early years, ICT was seen as a panacea to solve the existing problems in education. Although Turkey has had poor economic conditions, it has taken a series of actions to integrate ICT in all levels of education. Since the first introduction to schools, MoNE has allocated considerable amounts of budget for the diffusion of ICT in teaching and learning process; and so many efforts have been undertaken such as in-service training of teachers and administrators, training of computer teachers and computer coordinators, providing courseware, and developing ICT related educational materials (Aşkar, Usluel, Mumcu, 2006; Özdemir & Kılıç, 2006).

In one of her researches, Akbaba-Altun (2006) mentions that the Turkish Educational System begun using ICT more than twenty years ago. In 1984, MoNE firstly introduced computers to secondary schools. Then in 1991, computer-aided instruction was included in national educational policy. More recently, in August 1997, the Turkish government approved a new Basic Education Law No. 4306 and extended the duration of compulsory basic education from five years to eight years; and it has initiated a two-phased project called "Basic Education Program" (BEP), which was financed by the World Bank, to support the objectives and provisions stipulated by this law (World Bank, 1998, 2008). At the beginning, the amount of budget required for the BEP to reach its goals was determined as 11.3 billion dollars. However, while planning studies were continuing, it was seen that the resources were insufficient. As a result, financial support was requested from the World Bank for the project, and in 1998, MoNE received a loan equivalent to 600 million US dollars for supporting the process of the BEP (MoNE, 2006a).

As a comprehensive educational investment program, the main objective of the BEP, as stated in the Project Appraisal Document in 1998, is to improve the overall quality of basic education in Turkey. More specifically, the project is initiated to achieve the following objectives (World Bank, 1998, p.2):

(1) achieve universal coverage in an expended eight-year basic education cycle

(2) improve the quality and relevance of basic education,

(3) make basic education schools a learning resource for the community

In addition to these main objectives, in order to improve the quality of Turkey's education, one of the objectives of this development program is to ensure that each student and teacher becomes at least literate in ICT (Akbaba-Altun, 2006).

Basic Education Program Phase I:

The first phase of BEP was initiated on 01.08.1998 and completed on 31.12.2003. The work that has been completed within the framework of the first phase is as following (MoNE, 2003a, 2006a; World Bank, 2002):

(1) MoNE has included computer literacy and education in primary education curriculum, and established and equipped learning centers named "Information Technology (IT) Classes" in almost all primary schools throughout the whole country.

(2) The infrastructure for 3.188 information technology classes in 2.802 primary schools was completed; and including these IT classrooms, 6.180 schools were equipped with computers, printers, scanners, TVs, overhead projectors, video players, multimedia software, video cassettes, transparency sets, and slides.

(3) A total of 56.605 computers and related equipment were distributed to 26.244 primary schools located in rural areas.

(4) 1.630 laptop computers were purchased and distributed to 3000 primary education inspectors, who were then given training on computer literacy, active learning and teaching strategies, and educational management.

(5) Including the schools where IT classes have been established, projection equipment was bought and distributed to 6.255 primary schools.

(6) 250 computer teacher trainers selected from different schools with IT classrooms were trained on various subject areas in order to make them gain the necessary qualifications for training computer teacher trainers in provinces.

(7) 25.000 primary school teachers, working in schools where IT classrooms were established, were trained on computer literacy by computer teacher trainers, and 2.558 computer coordinators were trained on information technologies in various in-service training programs provided by MoNE.

(8) 15.928 teachers in schools where IT classrooms were established were provided with basic (computer literacy) and advanced (Windows NT, Proxy, MS Office, Internet, Windows 98) computer training by the contract firms providing hardware and software to schools in order to enable the use of IT classrooms established in primary schools by teachers in the most effective way.

(9) 18.517 overhead projectors were purchased and distributed to primary schools in rural areas.

As far as the main outputs of the first phase of the BEP are concerned, the project did not demonstrate the expected impact on the quality and relevance of education (World Bank, 2008). Although the outcomes of the first phase rated as unsatisfactory, it has made some contributions to integrate ICT into Turkish Educational System. With the implementation of the BEP, it was seen that IT classes have enabled administrators, teachers and especially students to have access to ICT. Furthermore, it is undeniable that IT classes are important in terms of the opportunities they provide for students. Since two of every three students start using computers at school and do not have any opportunity to use computers

outside school, IT classrooms established in schools through the BEP are the first places where most students use computers for the first time (MoNE, 2006a).

Basic Education Program Phase II:

Upon implementation of Phase I, Turkey and the World Bank signed the Second Phase Loan Agreement for Phase II on 26 July 2002; and Turkey has received a second credit of 300 million US dollars to support the same goals as the first phase activities. Within the scope of the second phase, the goals of the first phase were expanded and pre-school education and special education programs were added in addition to the basic objectives of expanding the coverage of basic education around the country, and increasing the quality of basic education and computer-based learning and teaching (MoNE, 2006a). The second phase of the project was initiated to support the BEP over the three-year period including 2002/03, 2003/04, and 2004/05 academic years. The activities supported through the second phase included concentrating on increasing coverage and improving quality of education especially among the children of low-income families and those with special needs. In addition, through the second phase of the project, a greater number of children were provided with the opportunity to have access to ICT in basic education schools across the whole country (World Bank, 2008).

Through the second phase of the BEP, the following initiatives were added to the activities of the first phase (MoNE, 2003b; World Bank, 2002):

(1) Approximately 3.000 additional basic education schools throughout the country were provided with ICT hardware and software; and an educational web portal was established.

(2) About 4.000 additional basic education schools were provided with educational materials.

(3) ICT in-service training programs were provided to basic education school teachers to provide them with basic computer skills and to assist

them to use ICT to improve teaching/learning process; and to inspectors to assist them provide pedagogical ICT support to schools, and to assist computer teachers to utilize the existing ICT classrooms to their full potential.

Through the BEP, activities have been carried out at every level of the Turkish Educational System in order to use and expand new technologies in education. In addition to these activities, with this project, it was aimed to ensure that teachers and student would be able to use ICT effectively in teaching and learning process (MoNE, 2006a).

The outcomes of the BEP could be summarized as the following (MoNE, 2006a):

(1) IT classes were established in 15.000 schools in rural areas.

(2) Computer coordinators of 18.000 IT classrooms were educated through in-service training programs.

(3) 200.000 educational staff were given in-service training on computer literacy and computer assisted education.

(4) 51.465 computers were provided for 26.276 basic education schools; and a printer, a scanner, educational software and an uninterrupted power supply (UPS) were provided for each of these 26.276 schools.

Progressively, the MoNE is still designing and implementing various activities in its efforts to improve the quality of education through introducing computer literacy and training into basic education curriculum. These activities are carried out to achieve the following objectives which are defined as the IT component of BEP (World Bank, 1998: Annex 2; pp. 8-9):

(1) train IT coordinators, teachers and administrators in computer literacy and in computer-aided instruction through in-service training;

(2) provide a phased introduction of computer resource centers firstly to existing schools in sub-provinces with high student populations, then to regional basic education boarding schools, and subsequently to remaining basic education schools;

(3) provide Turkish educational course software;

(4) expand Internet connectivity and services in order to allow schools to be linked to each other and Turkish educational web sites;

(5) strengthen communication between IT coordinators, teachers, and universities through information bulletins, web sites and annual, regional workshops to review best practices.

In addition to the BEP, Turkey has also initiated some other major projects to integrate ICT into Turkish Education System. In 1993, a new project called "Computer Experimental Schools (CES)" was initiated by MoNE with the financial support of the World Bank. In accomplishing this project, 53 schools located in different regions of Turkey were equipped with basic hardware and software in order to increase the potential in teaching and learning. With this project, it was also aimed to provide a technological and pedagogical edge through a computer-mediated communication network linking the schools in CES project (Yedekçioğlu, 1996). Meanwhile, a special unit called Department of Information Technology in Education (DITE) was created within the General Directorate of Computer Education and Services (BILGEM) to take responsibility for the CES in the same year. CES project was an opportunity for Turkey to use schools as an experimental platform to evaluate how computer-based education could facilitate instruction and provide instructional tools for teaching and learning (Schware & Jaramillo, 1998).

Another initiation for ICT integration was the project called "Project for Globalization in Education 2000", which was supported financially by the World Bank. The aim of this project was to keep pace with the developments of the

information age and to use instructional technology in each level of the education system in order to be able to create a society with adapted information and technology standards. Through this project, new IT classrooms were established in 2,451 basic education schools in 81 cities and 921 towns in Turkey. In each of these schools the technology classrooms were equipped with computers, printers, scanners, office program, courseware for computer literacy, courseware for different subjects, edutainment (education + entertainment) courseware, electronic references, video, overhead projectors, TV, educational videocassettes, and transparencies (Akkoyunlu & Orhan, 2001).

It is seen that Turkey has made a large financial investment to integrate ICT in education. However, the effective use of ICT in schools depends not only on financial resources but also on other interlinking variables one of which is a good and systematic planning to integrate ICT into the curriculum. While making investments in ICT, it should be taken into consideration that "while it would be difficult to deny the value - even the necessity - of bringing technology into schools, evidence from the past decade provides strong evidence that misguided policies and funding ICT in education may fail to have the desired education outcomes, while costing more than other education interventions" (Wagner et al., 2005, p.1).

2.4.2. ICT in the National Education Projects in Turkey

In order to keep face with the information age, MoNE aims to integrate ICT into the Turkish Education System via certain policies and development strategies, and it aims to become a societal focus on information and technology through these policies and strategies (Göktaş & Aybat, 2006).

In this sense, MoNE has promoted the following goals (MoNE, 2006a, pp. 66-67; UNESCO, 2004, pp.28-29):

(1) ICT hardware and software will be provided in every school including primary education schools;

(2) Secure and fast Internet connection will be provided to all schools;

(3) At least one computer with an internet connection will be provided in every village school;

(4) All students, teachers, directors, parents, and the school staff will be able to access ICT;

(5) One ICT class with 20+1 computers per 500 students, at least 2 computers with internet and intranet connection per teachers' room and at least 1 computer will be provided with the same specs for the guidance services, libraries and administration offices;

(6) Necessary in-service training courses will be provided in order to ensure that teachers, students, directors and the school staff are able to use ICT and successfully take advantage of it during the educational processes;

(7) Current curriculum will be transferred into a student-centered one and it will be provided that students access information by using ICT tools by themselves during their educational processes;

(8) School administration processes will be developed through ICT tools;

(9) Necessary environment will be created for creating and using a qualified digital content. Work will be carried on in order to ensure that the digital content provides a self-learning environments for the students;

(10) Work will be carried on in order to avoid the digital divide and ICT at schools will be at all citizens service;

(11) School Technical Support Centers will be established in order to provide the necessary technical support for the update and continuous maintenance of the ICT hardware at schools.

MoNE has initiated a series of projects in order to reach above-mentioned objectives. At the end of the National Education Project, which was carried out in cooperation with World Bank and Higher Education Council (HEC), teacher training programs were reconstructed in order to train prospective teachers with knowledge and skills to use ICT effectively in their subject area in 1998. After this year, the number of ICT projects increased. Table 2.1. and the following parts provide a list of projects in which ICT integration and diffusion has been of high importance by MoNE:

(1) Ministry of National Education – Internet Access Project:

This project was developed by MoNE in cooperation with Turk Telekom Inc. The aim of the project is to provide students with fast, robust and continuous internet access in computer laboratories at schools so that they can use, produce and share information through e-learning. With this project an important step has been taken in the way of e-education application at every level of education and training. This project had four phases which were completed in the time periods between February 2004 and December 2005. In the first phase, 4,074 schools; and in the second phase, 4,000 schools were provided with ADSL broadband internet connection. In the third phase of the project, additional 11,296 schools, and in the last phase, remainder 22,534 schools were provided with internet connection. At the end of the project, in December 2005, a total of 42,534 schools have been provided with ADSL broadband internet connection. Under this project, by the end 2007, 59% of basic education schools and 95% of high schools have had Internet connection; and approximately 12 million of students could use Internet in their schools (Eğitek, 2008b; Keskinkilic, 2004; MoNE, 2008a; UNESCO, 2004).

(2) Education for the Future Project:

This project was developed in cooperation with Intel and executed by General Directorate of Educational Technologies in accordance with 40 countries around

the world. The aim of this project is to increase the quality of education, to provide ICT facilities for the use of students, to assist teachers for integrating ICT into their teaching process, and to encourage teachers to utilize ICT as an educational tool. Under this project, in the first half of 2004, 10,500 teachers were trained for computer literacy; and by the end of 2005, more than 30,000 teachers working in different levels of schools completed the program. With this project, it was aimed to train a total of 50,000 teachers by the end of 2006. Teachers' trainings for computer literacy and ICT are still going on under the Education for Future Project (Aktürk, 2005; Aytaç 2004; Eğitek, 2008b; UNESCO, 2004).

(3) E-Learning – Educational Portal Project:

This project aims to increase the quality of education and reduce the digital gap in education by means of promoting wider access to information sources for teachers, students, school administrators, and parents (Aktürk, 2005; Eğitek, 2008b; UNESCO, 2004). Educational Portal Project provides a wide range of online services and learning materials for the education community in order to deliver equal learning and training opportunities for all individuals so that they can maximize their potential, develop and grow. This project enables students to learn in a learner-centered method without a time and place limitation; and it is seen as a gateway for educators to corporate with other schools to develop internet based projects (Eğitek, 2008b). Under the Educational Portal Project, the MoNE has initiated the following web portal projects:

(3.1) Access to Information Portal:

This project was the first for the Educational Portals; and it was initiated as a pilot study in 2005-2006 academic year (Aktürk, 2005; MoNE, 2008b). Access to Information Portal is an information access portal prepared for the use of students, parents, primary school teachers, and school administrators (Göktaş & Aybat, 2006). With this portal, it is aimed to serve approximately 180,000 students and 6,000 primary school teachers (MoNE, 2008b).

(3.2) Skoool Interactive Learning and Teaching Technology:

This project was developed in cooperation with Intel; and it is designed to exemplify the benefits of multi-media technology and stimulate wider use of these technologies to advance student education. Skoool Interactive Learning and Teaching Technology program is designed for primary school students, and it aims to help students learn and explore mathematics and science concepts through interactive technology (Intel, 2008; MoNE, 2008c).

(3.3) Teachers' Portal:

This portal provides teachers working in levels of education with curriculums, sample daily and unit plans, activities, and some educational materials. This portal serves the teachers under the supervision of Educational Board of Turkey (TTKB, 2008).

(3.4) Wild Web Woods Educational Portal:

This project, which is an online game for teaching children between the age of 7 and 10 the basic Internet safety, is launched in Turkey by The Council of Europe in cooperation with the MoNE. This online game aims to help children learn the skills to use the Internet in a safety way, and to recognize and react responsibly to potentially dangerous situations by introducing basic Internet safety rules, in addition to notions of human rights and respect for others (COE, 2008).

(3.5) ThinkQuest Educational Portal:

This educational portal is developed by the Oracle Education Foundation, and MoNE plans to implement this project in a time period between November 2008 and June 2009. ThinkQuest Educational Portal is a

collaborative online learning platform in which teachers and students can create learning projects and develop the technology skills required in the 21st century (MoNE, 2008d; Oracle, 2008).

(4) Information Center Project:

With cooperation of the General Directorate of Educational Technologies, MoNE has launched Information Center Project to provide information sources (e.g. monographs, videotapes, filmstrips, presentations, audiotapes, CDs, DVDs, and VCDs) and user services for the researchers in the field of education (Eğitek, 2008b). With the project of information centers, it was aimed to provide learning environments with internet services where a large number of people can access the information they need (UNESCO, 2004).

(5) Microsoft's Partner in Learning – Teacher Training via Distance Learning Project

The aim of this project is to increase the level of computer literacy for computer literate teachers and train the other computer illiterate teachers to acquire computer literacy. With this project, it is aimed to create a workforce of teachers who have ICT skills and are able to use these skills in their teaching process. Under this project, by the end of 2006, approximately 85,000 teachers were trained on ICT skills (Aktürk, 2005; Eğitek, 2008b).

(6) Automation of Distance Education Services Project:

This project was initiated by the MoNE and executed by the General Directorate of Educational Technologies in 1999 and continued until 2003. This project aims to provide the Open Education Schools' students with services through fast and secure Internet. The most important objectives of the project include active use of information technologies for education and providing technological infrastructure to offer distance education opportunities to the students (Eğitek, 2008b).

(7) Vocational Training through Distance Learning Project:

With cooperation of the MoNE and Sakarya University, this project aims to improve access and quality of lifelong learning in accordance with the needs of the students and work life by taking into consideration country's social and economic conditions. With this project, it is also aimed to provide training for all individuals of all ages in order to help them gain a profession through distance education (UNESCO, 2004).

In the Turkish Educational System, the most important institution in the MoNE projects with regards to the ICT organization and the implementation of the ICT projects is "General Directorate of Educational Technologies (EĞİTEK)", which was first started in 1950s. When it was first founded, this institution was composed of two branches. One of the branches of this institution was the Bureau of Tests; the other was Educational Film Center. Bureau of Tests was turned into Technical Services Department, Information Processing Department and finally Computer Education and Services General Directorate. On the other hand, Educational Film Center was turned into Film Radio Graphics Center, then Film Radio Television Education Directorate. In 1998, these two branches were conjoined to form General Directorate of Educational Technologies (Eğitek, 2008).

The objective of the EĞİTEK is to become a perfect Educational Technology center of Turkey. It has been producing various audio-visual, computer-based, digital educational tools for the use of educational activities. Besides, it aims at supporting learning and teaching with information technology tools. Also, it provides the services of researching, planning, implementing and evaluating the exams of Open Education Schools, carrying on the centralized governmental and private exams and executing the computer services of all department of MoNE in countrywide. EĞITEK carries on its services through the Department of Management of Revolving Funds as well as through general budget allocations (Eğitek, 2008b).

The main services which are carried on by the EĞİTEK include (Eğitek, 2008a; Göktaş, 2006; Göktaş & Aybat, 2006):

(1) Conducting research, project, development, follow up, and assessment and evaluation studies to support education with technological developments, and to plan for extensive usage of technology in education,

(2) Offering educational opportunities throughout the country and in some international centers via distance education,

(3) Producing or purchasing visual, auditory, printed and computer based educational materials,

(4) Establishing computer laboratories in schools, training the related personnel, and offering maintenance services.

With regard to the projects initiated by the MoNE with an intention to increase the use of ICT in educational environments, it should be taken into consideration that when integrating ICT into education, the availability of ICT equipment does not ensure that ICT will be integrated effectively into education. There are many factors that should be taken into consideration before making any investments for ICT integration. According to Barnett (2001), technology integration is not about hardware, internet connections, or other similar factors. Barnett (2001) points out that in order to ensure that investments in ICT have an impact on students and teachers, schools must develop a thoughtful technology plan which creates a vision of how ICT integration will impact learning and teaching. Wright and Wilson (2005) state that change towards ICT integration in education must begin with prospective teachers; therefore, teacher training programs should be first places to start integrating ICT into education. Similar to Barnett's (2001) point of view, Patricas and Newton (1999), underline the importance of developing a thoughtful technology plan for ICT integration. The authors point out that there is a need to allocate finite technology funds cost effectively and to positively exploit

those expenditures through careful targeting of identified needs. Similarly, Rogers (2005) contends that the most important element of effectively integrating ICT into academic curriculum is formulating a comprehensive technology plan.

Table 2.1. Some of the ICT Projects in Turkey

ICT Projects in TURKEY		
Name of the Project	**Related Institution**	**Objective**
E-examination Project	EĞİTEK	Organizing and applying the examinations that EĞİTEK is responsible through internet and e-mail through providing efficient use of the technological facilities
Automation of Distance Education Services Project	EĞİTEK	Providing services via fast and secure internet to the Open Education Schools' students under Ministry of Education.
Ministry of National Education - Internet Access Project	EĞİTEK	Providing fast, robust and continuous internet access to computer laboratories at schools and Ministerial institutions
Ministry of National Education – Archiving Project	EĞİTEK	Keeping the records of the products of General Directorate of Educational Technologies and develop an archive system on computerized environment
Education for Future Project	EĞİTEK	Increasing the quality of education, providing information and communication technology facilities for the use of students, assisting teachers for integrating ICT to the classrooms and encouraging teachers to use ICT as a teaching tool
Information and Communication Technology Development Project	EĞİTEK	Providing computer literacy education for pupils and teachers or to increase the level of computer literacy, providing easy access to ICT tools for teachers and pupils, developing more efficient educational environments through integrating ICT into educational activities

Table 2.1. (Continued)

ICT Projects in TURKEY		
Name of the Project	**Related Institution**	**Objective**
Educational Portal Project	EĞİTEK	Promoting wider access to information resources for all, to deliver innovative and equal learning and training opportunities to help individuals, communities, maximize their potential, develop and grow & Providing an online interactive learning environment supporting the curriculum of MoNE
Secondary Education Project	EĞİTEK	Increasing the quality of the teaching and learning in secondary education, providing new equipments and meeting the needs of individuals and society parallel to technological developments
Basic Education Program	MoNE & World Bank	Improving the quality of education through the activities related to computer and communication technologies, establishing IT classrooms in basic education schools, providing skills training of skills training of administrators, inspectors and teachers and pupils
Open Education On Line Information Project	EĞİTEK	Providing resources to fulfill the educational needs of distance learning students and all other interested parties through a shared environment where all information and information resources are reached and online educational resources are available
E-Automation in Open Education Project	EĞİTEK	Providing all students and Education Systems districts electronic services and preparing E-Learning platforms

Table 2.1. (Continued)

ICT Projects in TURKEY		
Name of the Project	**Related Institution**	**Objective**
ILSIS (Provincial National Education Directorates Management Information System)	MoNE & World Bank	Establishing the information management system for provincial national education directorates
MEBSIS Management Information Systems	EĞİTEK	Providing easy access to the Ministry of National Education information for teachers-students-directors and other citizens
World Links for Development Project	EĞİTEK	Ensuring international information sharing and cultural interaction among 15 countries including Turkey, using an Internet-based model named "a project based learning model"
Vocation Acquisition through Open Education Project	EĞİTEK	Providing vocational training for citizens in several areas through remote education, and face to face education when needed
Ministry of National Education Information Access Center Project	EĞİTEK	Establishing an information access system and center
Ministry of Education Cyber Education Library Project	EĞİTEK	Using the Information Access Center resources to prepare education software for ensuring coverage of course books in line with teachers' and students' needs

(Eğitek, 2008b; Göktaş & Aybat, 2006; MoNE, 2002b)

2.4.3. Main Barriers for ICT Integration in Education in Turkey

In parallel with the advancements in ICT around the world, and the attempts of most countries to integrate ICT into their educational systems, the Turkish government has realized the need for chance and improvements in education in order to train individuals corresponding with the requirements of the information age.

As a result of the international trend of the increasing importance of ICT in education worldwide, Turkey started ICT-related initiatives as early as 1984 (Göktaş & Aybat, 2006). Since then, in Turkey, various policies have been developed and many projects have been conducted in order to integrate ICT in schools (Yalın et al., 2007), and MoNE has allocated considerable amounts of money for spreading the use of ICT in education (Altun, 2007). However, as Akbaba-Altun (2006) emphasized, integration of ICT into a centralized educational system such as Turkey's is not as easy, and it depends on a successful design and application, which is an expensive and complex process. As discussed earlier, researchers have identified many barriers affecting ICT integration into education; and in the case of Turkey, the situation is more complex because of the structure of Turkey's educational system. Unfortunately, in Turkey, there are not much extensive research studies in regard to the problems and barriers faced during ICT implementation; and most of the research studies are done in specific schools or regions (Göktaş, Yıldırım, Yıldırım, 2006).

In a study conducted by Yalın et al. (2007) to investigate barriers faced by teachers and school administrators during the integration of ICT into teaching-learning process, it is found that the most important barriers to ICT integration are lack of training and lack of hardware, followed by lack of technical support, insufficient technological infrastructure, insufficient computer knowledge and skills of teachers, not having enough time for developing electronic materials, and having problems about planning use of ICT tools. In the same study, the authors also point out that although lack of pedagogical software is among the most

important barriers for ICT integration, it is given less importance because of the insufficient knowledge and skills of school administrators and teachers about ICT integration. Furthermore, according to the authors, teachers need contents and open strategies in order to use ICT in teaching-learning process, and therefore; teachers should be provided with online resources including good examples of technology integration, and materials should be provided by national education authorities.

Altun (2007) points out that teachers play a crucial role in deciding how to make appropriate educational use of ICT in the classroom; and they need to develop new knowledge and skills in the field of ICT. The author states that teachers are vital players in integration of ICT into teaching and learning process, and he implies that the main barrier for ICT integration is insufficient knowledge and skills of teachers about ICT integration into education. As a result, Altun (1997, as cited in Altun, 2007) suggests that there is a need to educate teachers in effective use of ICT in education, and teachers need to be trained in the following areas:

(1) Personal skills in the use of ICT

(2) Professional skills in the use of ICT

  (a) Understanding the relevance of ICT in education

  (b) Understanding how to develop a plan for ICT integration into teaching and learning across the curriculum

  (c) Developing skills for managing ICT in the classroom

According to the results of a survey conducted with K-12 teachers (Göktaş et al., 2006); the most significant obstacles and barriers teachers face in integrating ICT in education are: (1) lack of in-service training about ICT, (2) lack of technical support, (3) lack of hardware, (4) lack of basic knowledge-skills, (5) inadequate repertoire of knowledge and skills about ICT in instruction, and (6) lack of appropriate software and materials for instruction (See Table 2.2.).

Table 2.2. The Obstacles Faced in Integrating ICT into K-12 Schools According to Their Teachers (N=1429)

Obstacles	M	SD
Lack of in-service training about ICT	4.17	0.90
Lack of technical support	4.14	0.87
Lack of hardware (computer, printer etc.)	4.10	1.01
Lack of basic knowledge and skills about ICT	4.08	0.91
Inadequate repertoire of knowledge and skills on the integration of ICT in instruction	4.07	0.90
Lack of appropriate software and materials for instruction	3.97	0.99
Lack of physical environment for integrating ICT in classroom	3.88	1.07
Inappropriate course content and instructional programs	3.81	1.00
The constraints related to hardware (i.e. incompatibility with software, insufficient memory)	3.64	1.03
Inadequate support from upper positions	3.58	1.14
Lack of time for integrating ICT in classroom	3.36	1.20
Overall mean	3.93	

(Göktaş et al., 2006)

Similar to the above barriers, according to the results of a research study conducted by Çağıltay, Çakıroğlu, Çağıltay, and Çakıroğlu (2001), which addressed teachers' perspectives about the use of computers in education, teachers classified some problems related to integration of computers, which is the most known form of ICT, to the curriculum. These problems include:

(1) lack of enough number of computers,

(2) lack of teacher education about computer literacy,

(3) inappropriate instructional programs,

(4) lack of teachers' knowledge about how to use computer in instruction,

(5) load of the curriculum

Toprakçı (2006) also investigated barriers for the integration of ICT in schools in Turkey. To identify the main barriers, the author consulted teachers and administrators in primary education, and he used the "School Survey of Obstacles in Integration of the Schools and ICT", and administered this survey to 1564 persons in 214 schools. According to the results of this survey, the main barriers for ICT integration in Turkish schools include, with the decreasing order of importance: (1) limitation of ICT budget in school, (2) limited technical support for ICT in school, (3) scarcity of technical support resources of the school staff to be trained in ICT, (4) limited number of computers, (5) oldness or slowness of the system related to ICT, (6) limited number of educational software, (7) low level of interest and resistance to changes of the city directorships of the Ministry of Education, (8) low level of educational expertise and training of teachers and administrators, and (9) lack of interest and motivation, and resistance of both teachers and administrators to be open to changes.

In a study, in which the issues related to integrating computer technologies into Turkish Educational System were identified, Akbaba-Altun (2006) stated that educational intuitions in Turkey increasingly emphasize the use of ICT in order to develop new models for teaching and learning; however, the successful integration of ICT is not simple because it depends on interlinking variables. According to Akbaba-Altun (2006), "integrating computer technologies into education requires successful development of infrastructure, personnel, curriculum, administration, and supervision" (p.185). According to the results of this study, the main barriers for ICT integration, especially for integration of computer technologies into Turkish schools, include (1) limited number of computers, insufficient software in native language, and lack of peripheral equipment at schools, (2) placement of IT classrooms in existing classrooms

which are not designed according to the needs of IT classrooms, (3) lack of in-service training courses on ICT for teachers, (4) lack of technical knowledge of school principals and their ignorance in their technological leadership in integrating technologies into education, and (5) lack of well-planned and up-to-date training programs for supervisors, school administrator, computer coordinators, and teachers.

Yıldırım (2007) also conducted a survey of basic education school teachers to determine the main barriers that teachers believed prevented them fully integrating ICT in teaching process. In this study, Yıldırım (2007) collected data from 402 basic education school teachers concerning the sources of the problems that inhibit teachers' ICT utilization in schools. In this study, Yıldırım (2007) concludes that teachers play a vital role in ICT integration, and they are usually held responsible for the success or failure of ICT in schools; however, there are many other barriers for the diffusion of ICT. Results of his study indicate that teachers largely use ICT for creating handouts and tests, rather than using it to promote students' higher order cognitive abilities. According to the results of this study, there are a variety of obstacles to the integration of ICT in schools in Turkey. Yıldırım (2007) delineated the most important barriers as:

(1) School curriculum: Since the current curriculum is heavily based around various subjects and in-class activities, it is really tough for teachers to cover all subjects in the curriculum during a school year. Therefore, it is a really challenging task for teachers to find extra time for ICT integration into the curriculum.

(2) Lack of incentives: In the current system, there is a disincentive for teachers to engage in innovative classroom practices in that they are only paid for the number of hours that they teach, so any extra load is considered rightfully as an unpaid mandate. As a result, teachers are reluctant to design any extra curricular activity related to integration of

ICT into their teaching; and they need recognition and encouragement for their timely and effective use of ICT.

(3) Lack of pedagogical support: Technical support for ICT is not ample unless it is accompanied with pedagogical support. Teachers are left alone in their endeavor in using ICT; and pre-service and in-service training programs fail to demonstrate the new pedagogy of teaching with technology.

(4) Lack of clearly stated goals and expectations from ICT: Since the MoNE has not yet visibly announced and informed schools about what is expected from teachers with the provision of ICT, and what should be accomplished by using ICT; there is a great degree of confusion among teachers and as well as school administrators regarding the role and function of ICT in schools.

(5) Lack of collaboration among teachers: Teachers are not able to share other teachers' experiences and best practices of ICT use in their fields; and they are not aware of what other teachers teaching the same subject are doing in their schools regarding the use of ICT.

2.4.4. ICT Usage by Households and Individuals in Turkey

The State Institute of Statistics carried out a survey on the ICT usage of households and individuals in April, 2008. This survey is a country-wide survey which presents a picture of the ICT usage across the country.

According to the results of the ICT Usage Survey on Households and Individuals; 24.5 % of the households in Turkey have access to the Internet at home. In the time period between January 2008 and March 2008, of all the individuals in 16-74 age group, the percentage of computer use is 38.1 % and Internet use is 35.8 %. These proportions are 22.1 % and 19.7 % for rural areas, 46.8 % and 44.6 % for urban areas respectively (TurkStat, 2008) (See Table 2.3.).

Table 2.3. Proportion of Computer and Internet Use by Gender in 2008
(Between the age of 16 and 74)

		Computer Use (%)			Internet Use (%)		
		Total	**Male**	**Female**	**Total**	**Male**	**Female**
Computer and Internet Usage	Turkey	38,1	47,3	29,1	35,8	44,8	27,0
	Urban	46,8	56,7	37,0	44,6	54,3	35,1
	Rural	22,1	30,0	14,4	19,7	27,4	12,1
Within the last three months (January-March 2008)	Turkey	34,3	43,2	25,6	32,2	40,6	24,0
	Urban	42,6	52,3	33,0	40,6	50,0	31,4
	Rural	19,1	26,4	12,0	16,8	23,3	10,4
Between three months and a year ago	Turkey	1,8	2,2	1,4	2,2	2,8	1,7
	Urban	2,1	2,4	1,7	2,5	2,7	2,2
	Rural	1,2	1,7	0,8	1,8	2,9	0,7
More than one year	Turkey	2,0	2,0	2,1	1,4	1,5	1,4
	Urban	2,2	2,0	2,3	1,6	1,6	1,5
	Rural	1,8	1,9	1,7	1,1	1,2	1,0
Never used	Turkey	61,9	52,7	70,9	64,2	55,2	73,0
	Urban	53,2	43,3	63,0	55,4	45,7	64,9
	Rural	77,9	70,0	85,6	80,3	72,6	87,9

(TurkStat, 2008)

The results of the same survey indicate that, 27.2 % of the households have a PC (personal computer), 87.2 % have a mobile phone, and 8.5 % have portable computers. The same surveys show that 77.2 % of households have access to the Internet via PC, 24.3 have access to the Internet via portable computer while 18.4 % access via mobile phone (TurkStat, 2008) (See Table 2.4. and Table 2.5.).

In the same time period, of all the individuals in 16-74 age group, 37.6 % of computer users use computer at place of work, 61.6 % at home, and 21.8 % at Internet cafe. 38.4 % of Internet users use Internet at place of work, 55.2 % at home, and 24.2 % at Internet café (TurkStat, 2008).

Table 2.4. Availability of ICT Devices in Households in 2008

	Households having ICT devices (%)			Households having devices for Internet access (%)		
	Turkey	**Urban**	**Rural**	**Turkey**	**Urban**	**Rural**
PC	27,2	34,2	13,9	77,2	77,6	75,1
Portable Computer	8,5	11,3	3,0	24,3	26,0	16,1
Mobile Phone	87,2	5,5	2,7	18,4	17,6	22,1
Games Console	3,6	4,4	2,2	0,9	0,8	0,9
Handled Computer	0,5	0,6	0,3	0,9	0,9	0,8

(TurkStat, 2008)

By considering the gender and age group, proportion of computer and Internet use of individuals is the highest in 16-24 age group for both males and females. For all age groups, proportions for males are always higher than females. By considering education level and gender, proportions of computer use and Internet use are the highest for university graduates, 87.9 % and 87.2 % respectively. For high school graduates these proportions are 67.2 % and 64 % respectively (TurkStat, 2008).

By considering the labor force status in the reference period, proportion of computer and Internet use is the highest for employers (70 %, 66.3 %), employees (61.4 %, 58.6 %) and unemployed individuals (49.9 %, 47.8 %) follow them (TurkStat, 2008).

74 % of Internet users use Internet for sending/receiving e-mails, 65.2 % use for playing games/downloading images and music, 76 % use for reading/downloading online newspaper and news magazines and 69.7 % use for sending/receiving instant messages (TurkStat, 2008).

Table 2.5. Percentage of Households Having Devices Connected to the Internet in 2008

	All households (%)			All households with Internet access at home (%)		
	Turkey	**Urban**	**Rural**	**Turkey**	**Urban**	**Rural**
Desktop computer	18,9	24,0	9,1	77,2	77,6	75,1
Portable computer	5,9	8,0	1,9	24,3	26,0	16,1
Mobile phone	4,5	5,5	2,7	18,4	17,6	22,1
Game console	0,2	0,3	0,1	0,9	0,8	0,9
Handheld computer	0,2	0,3	0,1	0,9	0,9	0,8

(TurkStat, 2008)

2.5. Introduction of Computers into the Turkish Educational System

Today, governments around the world have put an increasing emphasis on improving and expanding educational opportunities for children because of the belief that as the economic systems of the countries are globalized, the health of national economies will increasingly depend on the skills and competencies of its young people to deal with the challenges of a rapidly changing world with large amounts of complex and dynamic information. As the countries respond to the challenges around them, policymakers and educators have realized that integration of ICT into education is a crucial element of the 21st century educational system. The growing importance of ICT in social, political, and economic life has forced policymakers and educators to rethink the intersection of ICT and education in order to prepare young people for the information age, and help them use ICT to support their engagement with the world around them (Light, McMillan Culp, Menon, Shulman, 2006).

In every field of life; including business, industry, science and education, it is seen that technology has a large effect, and people are forced to arrange their lives according to the demands of the technological developments. Every day, a new technological advancement is witnessed, and the world is changing rapidly; and it is impossible to predict what is expecting people in tomorrow's world. As Akkoyunlu (2002) stated the future is ambiguous for today's children in the rapidly changing world. In addition, it is impossible to predict with any precision what skills students will need to function as adults because of the speed and the uncertainty of the changes the world witness. As a result of this situation, many educators have concluded that technology integration in education would enrich the learning environments in schools, and students would be able to cope with the problems of this dynamic world in this way. Since it is obvious that technology has brought fundamental changes in education, major developments in the use of technology must take place in the schools (Akkoyunlu, 2002).

Parker (1997) stated that rapid developments and changes in technology have lead to drastic changes in education, which leads to the need for preparing students for these changes in the information society (as cited in Göktaş, 2006). Fortunately, as Akkoyunlu (2002) mentions, the MoNE has been aware of these changes and developments in the world; and as a result, it has valued the importance of equipping students and teachers with necessary ICT skills, and it has introduced ICT to education as a reform in the Turkish Educational System. In addition, the MoNE has realized that integration of new technologies is one of the ways to increase the efficiency and the productivity in education; therefore, it has emphasized the use of technological innovations and improvements in education.

One of the technologies that have a big impact on education is the computer technology. However, although the MoNE has realized the importance of computer technology and has taken a serious of actions to benefit from computers to enhance the learning environments in schools, the use of computers in education did not have a long history.

In 1940s, schools in Turkey had such instructional materials as maps, laboratory equipment, film strip projectors, and mostly printed materials. Between 1950 and 1970, schools began to use technologies such as audio and video cassettes, and overhead projectors. During 1970s, new instructional materials were introduced for the use of students and teachers. Furthermore, some big universities started to offer graduate programs in order to train professionals in the field of educational technology. Although some of the traditional technologies are still used in schools, educational policymakers have believed that students must gain the knowledge and skills they will need in the future. As a result, computers have gained more importance than any other educational technology in Turkey (Akkoyunlu & Orhan, 2001).

In Turkish Educational System, how computers began to be used in education and how computer education was born can be summarized as the following (Akkoyunlu, 2002, pp. 169-170):

> The study and use of computers in the Turkish Educational System were limited until to 1980s to universities and a few technical schools, which offered computer science programmes and programming courses for management and research purposes. With the advent of cheap microcomputers, a considerable amount of hardware began appearing in public and private schools in Turkey at a rapid rate.
>
> Computers have been used in MoNE's testing and research departments for more than 25 years. By the end of the 1960s, some universities started to use computers. Some universities and a few technical schools had computer science programmes and programming courses. As a result of technological developments in information technology, computer science and engineering programmes were established leading to Bachelor, MA and PhD degrees. There were also some departments that trained software and hardware engineers. At the same time, technical high schools opened programming departments to train intermediate manpower in this field (Akkoyunlu, 1991). Computers were used for commercial applications and also industrial and scientific applications. But it was only recently that the educational system was affected by computers in Turkey.
>
> In 1980s, the Turkish Government, through the Ministry of National Education, has placed a special emphasis on the utilization of computers

in schools. It was the most costly and the largest education project in the history of the Turkish Republic, with approximately 600 million US dollars of additional investment (Fidan, 1988).

Computers came into use in the Turkish Educational System in 1984. The Ministry of National Education began a pilot study, with 1100 computers spread for 121 secondary schools at a ratio of one computer to ten students. A total of 2400 computers were purchased for secondary and vocational schools between 1985 and 1987 (Akkoyunlu, 1991). In-service training was given to 225 teachers, and the use of computers was integrated into the curriculum. At first, priority was given to hardware over software and to use the teaching of BASIC and Pascal programming languages. Computers were spread through schools, and courseware for several subjects was developed.

MoNE co-operated with 24 universities, and more than 750 teachers were trained from various schools. After evaluating this 1989 pilot project, private computer companies and MONE signed an agreement with nine companies in order to start computer-based education (CBE). These companies developed several courseware packages for approximately 2000 hours in the 1989–90 school year, and they co-operated with universities to train teachers.

In 1991, more than 6500 computers were disseminated to 2400 schools. In order to integrate computers into schools, educational and scientific institutions and private research and development centers were provided (Askar, 1991). The General Directorate of Computer Education and Services was established in 1992 under the responsibility of MoNE. It aimed to integrate instructional technologies (IT) into schools by using computers at every level of schooling, training the teachers and improving Computer Based Education (CBE).

In the 1995–1996 school year, educational software was produced for geography, history, Turkish and science. MONE co-operated with the Scientific and Technical Research Council of Turkey (TÜBITAK) to produce the software. The software was developed at the Centre of Electronic Research and Development at TÜBITAK.

After the extension of compulsory education from five to eight years, MoNE made the decision to establish computer labs in at least two primary schools in every city and town during the 1998-1999 school year. New computer labs have been installed in 2541 primary and secondary schools in 80 cities and 921 towns. Up to 2002, almost 3000 computer labs for 25.000 computers have been established in 2481 schools in Turkey.

> Reasons for placing computers in schools vary from country to country. The Turkish Ministry of National Education's policy is to meet the national need for catching up with the age of technology. The MoNE declared a policy of widespread introduction of computers in schools. The MoNE is quoted as saying that training children to use computers at an early stage in the school system makes it easier for them to grasp the concepts of advanced computer technology at a later stage. (Akkoyunlu, 2002, pp. 169-170)

Considering the development of computer use in the Turkish Educational System, it is seen that MoNE has realized the importance of computers as a key to function effectively in the field of education; and it has tried to integrate them in schools throughout the whole country. Today, people live in an information society in which they are required to have some skills to obtain, process, and organize information with the help of the available technology. Therefore, as stated by the MoNE (2002a), one of the basic aims of education in Turkey is to equip people with these necessary skills by integrating technology in schools. For these reasons, in order to prepare students for the 21st century, it is important the Turkish government take a series of sound measures to improve the education in Turkey by means of computer technology. In addition, in a research conducted by Orhun (2007), it is stated that as well as being a supportive technology in teaching other subjects, computers are needed for 'teaching about computers'; and computer education is necessary for national progress and for preparing children for future.

Considering all of these facts, it is obvious why the Turkish government has placed a great emphasis on computer technologies, installed instructional technology classrooms in schools, trained teachers to use computers, integrated computer education in basic education curriculum and developed some policies and strategies to improve computer education in basic education schools.

2.6. A Review of Computer Education in Turkey

In the 21st century, there is an exponential growth in the use of computer technology in every aspect of life including the field of education; and there is an increasing optimism that technology could enhance instruction (Wonzey, Venkatesh, & Abrami, 2006). Computer technology can be considered a powerful and flexible tool for learning in schools; and it can provide alternative ways for teaching and learning process (Bereiter, 2002; Harasim, Hiltz, Teles, & Turoff, 1995). Similarly, in the report of PCAST Panel on Education (1997), it is stated that for the improvement of education, more extensive and more effective utilization of computers and other technologies should be integrated into education.

Today, people live in a society with numerous applications of computer technology; and as a result, schools have taken a new responsibility of achieving the goal of computer literacy at various levels. In other words, due to the deep impact of computer technology on our lives, the issue of computer literacy has begun to be broadly discussed, and the programs geared toward improving computer literacy has begun to be implemented in schools at various levels (Tsai & Tsai, 2003).

In Turkey, the MoNE, realizing the big impact of computer technology on education, decided to introduce computer education into the Turkish Educational System in 1994. Upon taking this decision, the MoNE has begun to plan for a policy on computer education and it has developed new strategies to integrate computer education in schools. After these initial attempts to plan and develop new strategies, the MoNE introduced computer education in basic education schools in 1998-1999 school year. In these early years, computer education was implemented only in schools which had an established computer lab ready to use. As well, in these early years, computer education was provided for the students at the grade level from 4 to 8 as an elective course, which was 1 or 2 hour a week depending on the grade level of the students.

According to the MoNE (1998), the first objectives of introducing computer education into the Turkish Educational System can be summarized as the following:

(1) Ensure that the population realize the impact of information and computer technology on every aspect of life, and that population is aware of the importance of information and computer technology

(2) Ensure that the population realize that they are living in an information society, and that they have necessary skills to access, process, create, organize and communicate information through education

(3) Bring about a computer literate society appreciating and using the computers in various aspects of life and in future employment

These early policies and strategies of the MoNE to introduce computer education in schools were implemented in schools until the 2006-2007 school year. In this time period, from 1998 to 2006, the MoNE continued to make some improvements in the computer education in basic education schools, and it invested a large amount of money to install information technology classrooms (computer labs) in schools throughout the whole country. By the year 2006, the MoNE has installed a total of 20.000 computer labs in schools, each of which cost approximately 20.000 US dollars. In addition, by regulations of the Higher Education Council (YÖK), new departments have been established in the faculties of education in the universities in order to graduate primary and secondary school computer teachers. As well, The Department of Information Technology in Education (EBIT) was established under the responsibility of the General Directorate of Educational Technology in order to plan and carry out basic computer education (computer literacy) at every level and in all schools in Turkey (Akkoyunlu, 2002).

Parallel to the new advancements in computer technology and developments in ICT, MoNE has realized that it should review and revise the strategies and polices

on computer education; and in 2006, the MoNE developed new policies on computer education in basic education schools and designed a new computer education curriculum. With these new initiations, the MoNE has planned to improve the computer education and to solve the existing problems in this area. With this new computer education program, the MoNE has expanded the scope of computer education by including the grade levels 1, 2 and 3. That is, it has designed the new curriculum so that it includes all grade levels from 1 to 8 in basic education schools. MoNE has adopted the gradual transition to the new curriculum; and it has planned to implement a part of this new curriculum (including grade levels 1, 2, and 3) in 2006-2007 school year; and the remaining part (including grade levels from 4 to 8) in 2007-2008 school year (TTKB, Reg. No: 347, 2006a). Then, in 2007, the name of the computer education was changed; and it began to be given under the title "Information and Communication Technologies (ICT)" in basic education schools (TTKB, Reg. No: 111, 2007).

The MoNE has developed the new computer education curriculum with an intention to improve computer education. However, because of the some regulations made in this new program, the MoNE has faced some reactions from computer teachers and it has been blamed for not being able to fulfill its goals for bringing computer literacy and skills to schools (Aktif Haber, 2006; Güçlü, 2006; Gülmez, 2006). Two of the most noticeable changes made in computer education with this new curriculum; and the ones that drawn the reactions of computer teachers are (1) the evaluation of students' performance without grading, and (2) the decreasing the length of computer education course from 2 hours to 1 hour a week for all grade levels (TTKB, 2006b). As a result of the negative reactions from computer teachers, in 2007, the Educational Board of Turkey (TTKB) reviewed the new curriculum and it took a new decision to increase the course hour from 1 hour to 2 at grade levels 4 and 5 (TTKB, Reg. No: 111, 2007).

Although the MoNE has tried to make an innovation in computer education by developing a new curriculum, most computer teachers and students have become

aggrieved because of the changes made in this new curriculum. Therefore, the MoNE has should considered the needs and beliefs of the computer teachers and students, who are the actual implementers of the policies, before attempting to make any innovation. In this way, it could be possible to achieve the actual success in computer education.

When the new computer education curriculum is compared with the old one, it could be relatively said that new curriculum has some positive aspects in terms of its objectives, performance indicators, project-based activities, sample activities and evaluation modules; despite the problems encountered in its implementation (Seferoğlu, 2007). In the old computer education curriculum, which was implemented from 1998 to 2006, the needs of the students were not considered and analyzed thoroughly, and the content for 4th, 5th, 6th, 7th, and 8th grades was almost identical. Since computer teachers had to keep up with the official curriculum, and the framework and the objectives were the same for 4th graders and 8th graders; they were repeating the same thing every year with the same students (Akbaba-Altun, 2006). With the new computer education curriculum, the content has been changed and a new approach was brought to computer education. The content of the new curriculum is made up of eight progressive levels, which outline the goals and objectives definitely for each level, rather than constant and same learning objectives for each grade level. Computer teachers can choose a level from one to eight to teach depending on the background knowledge and skills of students in computer education without considering the grade level of the students. These eight content levels are divided into three main levels as: (1) basic level, (2) intermediate level, and (3) advanced level (TTKB, 2006b) (See Figure 2.1.).

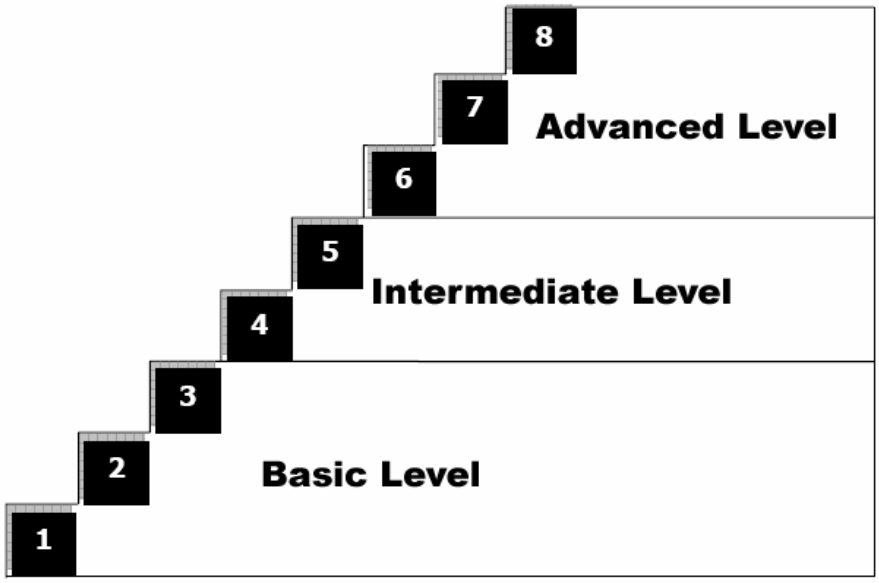


Figure 2.1. The Relationship between the Eight Levels of Computer Education Curriculum and the Main Levels (TTKB, 2006b)

Furthermore, with the new curriculum constructivist approach to teaching and learning processes has been adopted in computer education; and computer teachers are required to use student-centered approach in their instruction. Besides, in each level of the curriculum, the main goal is to have students gain the knowledge and skills defined in the objectives through learning by doing and completing the activities of each level.

The teaching and learning process in the new computer education curriculum can be summarized as in the following figure.

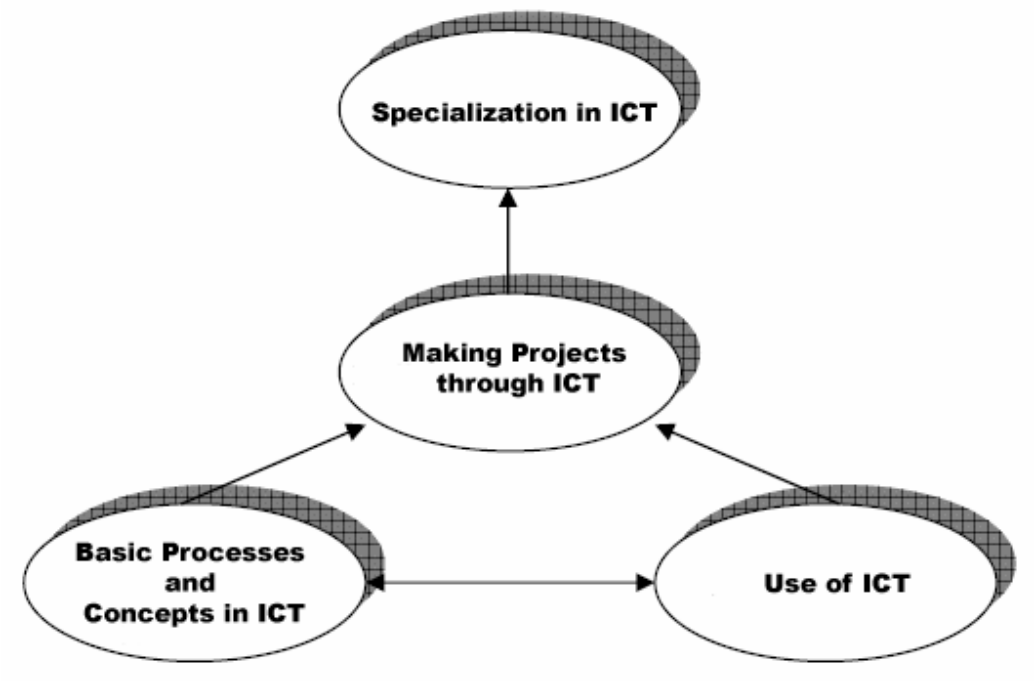


Figure 2.2. Teaching & Learning Process in New Computer Education Curriculum (TTKB, 2006b)

2.7. Training of Computer Teachers

2.7.1. Computer Teacher Training in the World

It is an undeniable fact that the number of computers in schools, which are used for instructional purposes, has grown immensely; and the quality and capability of computer hardware, software, and support materials has grown substantially. As a result of this situation, many educational systems in different countries have set goals, and are working to accomplish such goals as making all students computer literate or integrating computers in the entire curriculum. Many educational systems around the world now offer a wide-variety of computer-related courses, and integrate computer technology in teaching and learning process. This situation

has emerged a new category of educators, which is called computer teacher (Moursund, 1985).

Although the instructional use of computers has increased notably in recent years; in the literature, there is lack of studies conducted to investigate about computer teaching or the role of computer teachers. Law & Plomp (2003) state that titles or roles of teachers who are responsible for integrating computer technology into instruction changes from one country to another including computer coordinators, technology coordinators and media specialist; and the terms computer literacy, ICT literacy and IT literacy are used interchangeably.

Regarding to the integration of ICT into education, computer education is included in the curriculum in two ways: (1) computers are taught as a separate subject in the curriculum, (2) computers are used as a tool for teaching other subjects (EURYDICE, 2001). In learning and teaching about computers, the field of computer science, along with related areas such as information science, is considered as a separate subject area in curriculum with a purpose of making all students computer literate. In learning and teaching integrating computers as a tool, the computer is considered as an instructional tool in various subject areas with a purpose of using computers to increase overall knowledge and skills of students in those subject areas (Moursund, 1992). Although computers are used in two different ways in education, it is obvious that educational systems of most countries are based upon subject matter specializations, especially at the secondary level and higher. Therefore, it is seen that computer teaching should be a separate subject matter in schools, and schools need computer teachers (Moursund, 1985).

In the early 1990s, in many European countries including Spain, Denmark, England and France; computers were taught as a separate subject matter in curriculum especially at the secondary level, and these courses were mostly labeled as computer literacy in education (Baste, 2003; Kington & Harris; Pedersen, 2003, 2003; Reignier, 2003). Some countries still continue teaching ICT

skills as a separate course (Law & Plomp 2003). For example, in England, schools are free to teach ICT as a separate course although as Kington & Harris (2003) mentioned, teachers integrate ICT in other subject matters such as mathematics, science and English. Moreover, in Asia, expect for China Hong Kong, all countries teach ICT skills as a separate course (Law & Plomp 2003).

However, on the other hand, as Law & Plomp (2003) emphasized nowadays the main focus of technology integration in education has shifted from learning about ICT to learning through ICT. In the early 1990s, computer skills were taught in the courses that focused on the instrumental use of computers. Today, the focus is on teaching computer skills by making students use technology (e.g. Internet or educational software) in their inside or outside school assignments and tasks. In developed countries such as most of the Western European countries and USA, computer education is integrated in the whole curriculum, and ICT competencies are taught are as a part of other subject matters (Anderson & Dexter, 2003; Zander, 2003).

According to Law & Plomp (2003), if ICT is taught as a separate school subject, teachers with subject expertise in computing and other ICT skills are required to teach this subject in schools. On the other hand, if ICT is implemented as a tool for learning and teaching across the whole curriculum, then it is unavoidable that every teacher in school is affected. In that case, teachers need to master some basic skills about the use of ICT.

Law & Plomp (2003) claim that staff development is a key factor in ICT implementation in the curriculum, this situation creates new roles for all stakeholders in the educational area; and schools and class teachers are not able to achieve these new roles by themselves. Based on the literature review, it is seen that there are not clear standards regarding to ICT teacher training. According to Law and Plomp (2003), the roles of the teachers who are responsible for integrating technology vary across the countries, and teachers have different responsibilities in the different practices. Davis, Preston and Şahin (2008)

supported that researches that compare the effectiveness of different methods for ICT teacher training are rare because ICT teacher training varies with each culture and the context of different countries.

According to the report of the EURYDICE (2001), which gives information about basic indicators on the incorporation of ICT into European education system, the importance of ICT teacher training goes hand in hand with the inclusion of ICT in the education of students; and only teachers who have been trained in the use of ICT can be in a position to supervise the students effectively as they gain ICT related knowledge and skills. In the same report, it is stated that teachers who are specialists in ICT are responsible for ICT teaching at primary level in only a few such countries as Estonia, Hungary, Poland, and Romania. On the other hand, teachers who have specialized in ICT are mainly employed at secondary level in a great majority of countries such as Denmark, Italy, Portugal, Iceland, and Norway.

The report of EURYDICE (2001) also indicates that teachers who are held responsible for ICT education in schools receive special training on ICT. For example, in Netherlands, teachers receive special training on ICT for one year after their initial training at university level; and on completion of this training, they serve as ICT coordinators in schools. In Belgium, teachers take courses in which they specialize in ICT in universities, after they completed their basic training. In Luxemburg, engineers and university staff, who are specialists in computer science, give ICT courses in secondary education. In France, university trained teacher give courses on ICT in secondary education. In Malta, all teachers at primary level are required to specialize in ICT; and mathematics teachers give courses about ICT at lower secondary level. Moreover, in England, all primary school teachers are trained to teach all subjects including ICT (EURYDICE, 2001). Finally, although in most European countries, training in ICT is compulsory for all future teachers regardless of the educational level they work (EURYDICE, 2001), it is seen that a full-time ICT coordinator is required to

integrate technology successfully into school curriculum and to provide a vision for technology integration (Lai & Pratt, 2004).

2.7.2. Teacher Training System in Turkey

Since the establishment of the Turkish Republic until the early 1980s, teacher training in Turkey was conducted in teacher training schools and village institutes. Both of teacher training schools and village institutes were educational institutes at the secondary level. In addition to these, teacher training was also conducted in higher education level 2-3 year of education institutes, high teacher schools, and related departments of universities (Çakır, 2008).

While many different models of teacher training have been implemented from the establishment of the Republic to the early 1980s, the main change in the Turkish teacher training system took place in 1981 when the responsibilities and activities of teacher training were transferred from MoNE to the universities (Akyüz, 2004; as cited in Güven, 2008). Before 1981, all teacher training institutions were both academically and administratively under the control of MoNE. In 1981, with the Higher Education Reform, a unified higher education system was introduced, through which all academics and four-year teacher training institutions were changed into four-year faculties of education at universities. It was assumed that problems such as the quality of education, the quality and the number of staff, etc. could easily be solved by means of the changes brought about by the unification of teacher training institutions (Güven, 2008). In 1982, Higher Education Law (No: 2547) was put in practice; and with this law, all higher education institutions were brought together under the presidency of Higher Education Council (HEC). With this law; structure, status, and progress of the teacher training system in Turkey has changed; and teacher training institutions were restructured under the names of education faculties and education colleges (OECD Report, 2005). Today, most of the education faculties in Turkey have programs for training preschool teacher, primary school teachers, subject-matter teachers for basic education schools, and secondary school teachers.

In 1980s, the curricula of teacher training were dominated by the educational disciplines, philosophy, psychology and sociology; which were believed to be a key part of the content a professional teacher needed to know, and the basis on which teacher could continue their studies for higher degrees. Starting in 1998, all education faculties in Turkey have followed a standardized curriculum prepared by the HEC. With this new curriculum, preparation of teaching profession requires prospective teachers to acquire knowledge and skills in three domains: (1) general culture, (2) special subject training, and (3) pedagogy. When teacher training curriculum is explored, it is seen that pedagogy domain consists of 30 credit hours and constitutes of one fifth of the whole curriculum; while the majority of courses are related to special teaching domain; and the rest of curriculum is related to general subject matter (Güven, 2008).

In addition, with the "Act of Teaching Practice for Teacher Candidates who will serve in schools under the MoNE", the teaching practicum includes three sessions of field experience during the four-year teacher education; which provides prospective teachers who are studying at faculties of education with a chance to practice teaching in the schools of ministry (Çakır, 2008; Güven, 2008). The first session of these teaching practice courses is during the second semester of the first year, and the other two sessions in the first and second semester of the fourth year (Güven, 2008). The Act of Teaching Practice includes two sessions of observation and one session of actual teaching practice. By the help of these teaching sessions, teacher candidates get prepared for the profession and understand the basic characteristics, realities and the difficulties of the teaching profession (Çakır, 2008).

2.7.3. Computer Teacher Training in Turkey

In 1980s and 1990s, educational policies of most countries all over the world have been influenced by two factors: (1) the appearance of a new set of economic conditions associated with the increasing global competition, and (2) a series of fundamental educational reforms including significant changes in the structure

and the content of teacher training systems of the countries. Parallel to these trends all over the world, Turkey has realized a need for the reform of teacher education system including the policies developed and increasingly copied in other countries (Güven, 2008).

In response to global changes in educational area, Turkey has implemented a series of reforms to strengthen its own educational system. As one of these reforms, in 1990, The National Education Development Project was put into implementation with the loan agreement between Turkish Government and the World Bank. This project was initiated by the cooperation of MoNE and HEC, and it was managed by the British Council. The objective of this project was to improve primary and secondary education through increasing the quality and validity of teacher training and through increasing effective and economic resource utilization in the fields of administration and management (British Council, 2005; Özden, 1997; YÖK, 1998). As a part of the National Education Development Project, teacher training programs in education faculties have been reorganized with the cooperation of MoNE and HEC in order to meet short-term and long-term teacher requirements of the primary and secondary education institutions (Hamiloğlu, 2005).

In 1997, the Basic Education Law was implemented, which increased the length of compulsory education from 5 to 8 years. With the implementation of this law, there was a large need of teachers for additional students. Taking a look at the need for each subject area, it was seen that while some areas such as biology were over-subscribed, in some areas such as language there was a shortage. As a result of the need for more teachers in different subject areas and the dissatisfaction with the existing teacher training programs, HEC has restored teacher education programs at universities in cooperation with MoNE. The revised teacher training programs began to be implemented in 1998-99 academic year (YÖK, 1999).

With the reorganization of teacher training programs in education faculties, all teacher training institutes have been pushed to adjust their admissions and

programs to meet new requirements for new teachers. In addition, HEC has adopted a number of initiatives including introducing new teacher training programs in education faculties such as English teacher, preschool teacher, and computer teacher (Güven, 2008). As a result of these new regulations, departments of Computer Education and Instructional Technologies have been established in order to educate computer teachers for primary schools (YÖK, 1998). These departments, established within the education faculties of various universities, enrolled their first students in the 1998-99 academic year and gave their first graduates in the 2001-02 academic year (Orhan & Akkoyunlu, 2003).

The department of Computer Education and Instructional Technologies aims to train prospective teachers who will teach computer courses in K-12 institutions (both private and state) and to equip them with up-to-date knowledge and practical skills required for computer education. In addition, the department provides prospective computer teachers with professional skills in the development, organization and application of resources for the solution of instructional problems within schools (Middle East Technical University - Department of Computer Education and Instructional Technologies, 2008; Hacettepe University - Department of Computer Education and Instructional Technologies, 2008). Nowadays, there are currently 42 Computer Education and Instructional Technologies Departments in the education faculties of universities in Turkey (OSYM, 2008). However, some of these departments have been newly opened and they have not started their academic education nor do they have third and fourth grade students. The list of Computer Education and Instructional Technology departments can be seen in the Appendix A.

As mentioned before, HEC has redesigned the curricula for education faculties in Turkey. According to this new standardized curriculum, preparation for teaching profession involves the gaining of knowledge and skills in three main domains: (1) special subject matter domain, (2) pedagogical domain, and (3) general cultural domain (Güven, 2008). Like other teacher training education programs; in computer teacher training program, there are a total of 142 credit hours. In this

program, the pedagogical domain consists of 30 credit hours; special subject teaching domain consists of 109 credit hours, and the rest 13 credit hours are related to the general culture domain in the schools of education (YÖK, 2008). In addition, the teaching practicum takes place in three sessions throughout the four-year teacher training program. The first session, school practice, is during the second semester of the first year; and the other two sessions in the first and second semester of the fourth year (Güven, 2008).

When prospective computer teachers complete their education in teacher training programs in education faculties, they become competent both in subject matter and pedagogic domain. Computer teachers graduated from the Department of Computer Education and Instructional Technologies could be employed by both MoNE and private schools.

CHAPTER 3

METHODOLOGY

In this chapter, the research methodology and the procedures used in the study are presented; which includes research questions, design of the study, participants of the study and sampling, data collection instruments, data collection procedure, data analysis procedure, threats to internal validity, delimitations and limitations of the study, and a summary of the chapter.

3.1. Overall Design of the Study

This research study was designed to investigate the current status of computer education in Turkish basic education schools by exploring the perceptions of computer teachers in terms of new computer education curriculum and its actual implementations in schools. This study is mainly concerned with developing a deeper understanding about the effects of new computer education curriculum on the basic education school computer teachers and students, their perceptions about the effectiveness of the new curriculum, and the main barriers and enablers in computer education by comparing the policy of computer education with the existing school practice.

The research questions that have guided the all processes throughout this study are:

(1) To what extend do the current perspectives and instructional practices of the computer teachers working in basic education schools accord with the new computer education curriculum?

1.1. How does the existing school practice of computer education in basic education schools differ from the policy stipulations?

(2) How did the change in the hour of the computer education course affect the teaching and learning activities computer teachers use in their instruction?

(3) What are the perceptions of the computer teachers regarding the new computer education curriculum?

3.1. What are the perceptions of the computer teachers regarding the recognition and application of new computer education curriculum in basic education schools?

3.2. What are the perceptions of the computer teachers regarding the changes that have occurred in computer education since the duration of the course hour was decreased to one hour a week at all grade levels in basic education schools?

3.3. What are the perceptions of the computer teachers regarding the changes that have occurred in computer education since it was declared as an elective course at all grade levels in basic education schools?

(4) How is new computer education curriculum recognized by the computer teachers?

(5) Are there any differences among computer teachers' perceptions regarding the new computer education curriculum based on their gender?

5.1. Are there any differences among computer teachers' perceptions regarding the recognition and application of new computer education curriculum based on their gender?

5.2. Are there any differences among computer teachers' perceptions regarding the current changes in computer education due to the decrease in the course hour based on their gender?

5.3. Are there any differences among computer teachers' perceptions regarding the current changes in computer education due to its elective course status based on their gender?

(6) What problems and concerns are stated by the computer teachers in online asynchronous discussion forums pertaining to the new computer education curriculum?

(7) What problems and concerns are expressed in online and paper news pertaining to the new computer education curriculum?

In this study, a mixed method research approach is employed as the primary research method for the study in order to answer these research questions. Johnson and Onweugbuzie (2004) define mixed method research as "the class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study" (p.17). According to Mertens (2005), mixed method research design can be defined as "one in which both quantitative and qualitative methods are used to answer research questions in a single study" (p.292). Using mixed research method in the current study was realized by employing both quantitative and qualitative methods to collect data in order to answer the research questions and to have a broader and deeper understanding of them.

Johnson and Onweugbuzie (2004) emphasize that although both quantitative and qualitative research are important and useful, mixed research method is a bridge between quantitative and qualitative research methodologies as a complementary approach rather than a competitive approach with these two methods. The authors state that "the goal of mixed methods research is not to replace either of these approaches [quantitative & qualitative] but rather to draw from the strengths and

minimize the weaknesses of both in single research studies and across studies" (pp. 14-15).

Gürbüz (2004) states that educational research studies have produced different research methods, each of which offers its own benefits and drawbacks; and traditionally, literature on social science research methods support the studies that combine different methodologies. Mingers (2001) points out two important reasons for combining methods into a single research study. Firstly, mixed method research helps develop more reliable and richer research results by combining different methods. Secondly, different methods are required in order to generate information about different aspects of the world. Furthermore, as Onweugbuzie and Leech (2004) emphasize, mixed method research approach combining quantitative and qualitative research methods provides an opportunity to be more flexible and holistic in investigation techniques while addressing a range of complex research questions.

Greene, Caracelli, and Graham (1989) affirm the importance of a mixed method approach as "a design strategy is that all methods have inherited biases and limitations, so use of only one method to assess given phenomenon will inevitably yield biased and limited results. However, when two or more methods that have offsetting biases are used to assess a given phenomenon, and the results of these methods converge or corroborate one another, then the validity of inquiry findings is enhanced" (p. 256).

As aforementioned, in this study, a mixed method approach is followed based upon a quantitative method to explore the perceptions of computer teachers regarding computer education and a follow-up qualitative method including document analysis to confirm and complement the quantitative findings. In this study, by using techniques from both quantitative and qualitative research methodologies, it is aimed to answer research questions sufficiently in a single study and to enhance the reliability and validity of the research results.

3.2. Participants of the Study

The purpose of this study is to investigate the current status of computer education in basic education schools by exploring the perceptions of computer teachers regarding the policy of new computer education curriculum and its actual implementations in schools. Therefore, the population of the current study is in-service computer teachers working in basic education schools located in different provinces of Turkey.

In this study, because it is impossible to survey entire population, purposive sampling approach was used to select representative sample of computer teachers. Purposive sampling method can be defined as "a procedure by which researchers select a subject or subjects based on predetermined criteria about the extent to which the selected subjects could contribute to the research study" (Vaughn, Schumm, Singagub, 1996, p.58). As Johnson and Christensen (2004) point out when using purposive sampling method the researcher specifies the characteristics of the population of interest and locates individuals with those characteristics. Patton (1990) states that "the logic and power of purposeful sampling lie in selecting information-rich cases for study in depth where information-rich cases are those from which one can learn a great deal about issues of central importance to the purpose of the inquiry" (p.169).

As aforementioned; computer teachers working in basic education schools are the population of this study, and through purposive sampling method a total of 350 computer teachers from different geographical areas of Turkey were surveyed as the representative sample of the population. The most important criteria for the selection of the sample was that participants were the ones who had teaching experience both in the old and new computer education curriculum so that they were able to make a comparison between the two.

3.3. Instruments of the Study

In this study, data were collected through several data sources including a questionnaire, the analysis of messages posted by computer teachers in online asynchronous discussion forums, and the analysis of online and paper news about computer education and the occupational problems of computer teachers.

3.3.1. Computer Teachers Questionnaire

In the first phase of the study, Computer Teachers Questionnaire was utilized to collect baseline data on the perceptions of computer teachers regarding the new computer education curriculum and its current implementations in schools. The questionnaire includes both quantitative and qualitative data collection sections.

Questionnaires, consisting of multiple questions and statements, are recommended as an effective and in-expensive way of data collection in order to obtain the information about the thoughts, feelings, attitudes, beliefs, values, perceptions, personality, and behavioral intentions of participants in research studies (Johnson & Christensen, 2004). The questions in the Computer Teachers Questionnaire were developed with the following guidelines recommended by Fink and Kosecoff (1998):

(1) each question was meaningful for the participants,

(2) each question was concrete,

(3) each question avoided to include biased words and phrases,

(4) each question included just one thought.

Computer Teachers Questionnaire was developed to collect data from computer teachers as the participants of the current study, and it was distributed via e-mail and online forums of web sites that are frequently used by computer teachers. A

total of 350 questionnaires were collected in order to supply the data needed to explore research questions. The questionnaire was composed of mainly three sections (See Appendix B).

Section 1 consisted of 11 items including 4 dichotomous items, 5 multiple-choice items and 2 fill-in-the-blanks items. The items in this part represent demographic characteristics of the participants (e.g. gender), institutional information (e.g. ICT facilities in schools), and working conditions of the participants (e.g. weekly workload of computer teachers).

Section 2 consisted of 29 five-point Likert-type items. Each item in this part includes agreement statements ranging on a scale from strongly agree to strongly disagree. The items in this part were designed to investigate the perceptions of computer teachers regarding the recognition and application of the new computer education curriculum, and the current changes brought about this new curriculum.

Section 3 consisted of 23 items including 12 selecting items, 8 listing items, and 3 open-ended items. Selecting items in this part are used to investigate how computer teachers have changed their teaching methodologies with the implementation of the new computer education curriculum. Listing items provide the participants with choices to decide at which grade level computer education should be compulsory or elective and decide the length of computer education for each grade level. Open-ended items were included to investigate what kind of changes has occurred in the attitudes of students towards computer education with the implementation of the new curriculum, and what computer teachers think of should be done to change the situation for the better. Types and number of questions in the questionnaire is detailed in Table 3.1. The Computer Teachers Questionnaire can be seen in Appendix B.

Table 3.1. Types of Questions in the Computer Teachers Questionnaire

Types of Questions	Question No	Total #
Five-point Likert-type questions	**Part 2:** 1-29	29
Open ended questions	**Part 3:** 21-23	3
Multiple choice questions	**Part 1:** 4,6,7,8,10	5
Dichotomous questions	**Part 1:** 1,2,5,9	4
Short answer questions	**Part 1:** 3,11	2
Selecting questions	**Part 3:** 1-12	12
Listing questions	**Part 3:** 13-20	8

The Computer Teachers Questionnaire was developed by the researcher based on a review of related literature (Deryakulu, 2005, 2006; Deryakulu, Olkun, 2007, 2008; Kabakçı, Kurt, Yıldırım, 2008; Seferoğlu, 2007) in addition to the issues investigated in this study. Although some questions were inspired from an existing questionnaire developed by Timuçin, Öngöz and Tatlı (2007), the majority of questions were developed regarding the literature about ICT education and the own experiences of the researcher as a computer teacher.

After the questionnaire was developed, it was reviewed by peers (computer teachers) and examined by experts in order to provide content validity. Subsequently, the instrument was revised based on their suggestions and feedback. Before final version, the questionnaire was checked by a Turkish language expert for the clarity of the language. After revision, a pilot study was conducted with 50 computer teachers from different provinces of Turkey, and the Cronbach Alpha coefficient was calculated as 0.93, thus indicating as a satisfactory reliability.

Subsequently, a factor analysis was conduced to determine which items were grouped. Based on the factor analysis results, the items in the questionnaire were grouped in 3 factors (sub-scales). These factors are as following:

(1) Recognition and application of new computer education curriculum

(2) Current changes in computer education due to the decrease in the course hour

(3) Current changes in computer education due to its being an elective course

The first sub-scale is about how new computer education curriculum is recognized by computer teachers and what new curriculum has brought about in schools (e.g., I believe the system of using achievement levels in computer education has provided ease of implementation of new curriculum). The second sub-scale is about what kind of changes have occurred in computer education since the course hour had been decreased to one hour per week (e.g., I believe the limited time allocated to computer education has decreased the motivation of students). The third sub-scale is about what kind of changes have occurred in computer education as a result of its being an elective course (e.g., Because computer education is elective, students think that it is an entertainment activity).

After gathering data from participants, the Cronbach Alpha coefficient of the questionnaire was re-calculated and found to be 0.91 indicating a satisfactory reliability. Subsequently, a factor analysis was applied to the scale to determine whether the items measured the factors which was determined formerly. The Cronbach Alpha of factor 1 was 0.83, the Cronbach Alpha for factor 2 was 0.91, and the Cronbach Alpha for factor 3 was 0.93.

The reliability coefficients and the number of items in each sub-scale are demonstrated in Table 3.2.

Table 3.2. Reliability Coefficients for Computer Teachers Questionnaire Sub-Scales

Sub-Scales	# of Items	Items	Cronbach Alpha
Recognition and application of new computer education curriculum	9	1-8 & 11	0.83
Current changes in computer education due to the decrease in course hour	13	9-10 & 12-22	0.91
Current changes in computer education due to its being an elective course	7	23-29	0.93
Total	**29**		**0.91**

3.3.2. Analysis of Online Forum Messages and News about Computer Education

In addition to using the Computer Teachers Questionnaire to collect data; as an another form of data source, analysis of the content of messages posted by computer teachers in online asynchronous discussion forums about their occupational problems, and the analysis of the content of online and paper news about computer education were utilized. The examination of the content of forum messages and news has provided a chance to confirm and complement the results obtained through the self-reported questionnaire.

These online discussion forums were opened voluntarily by computer teachers in order to provide a common platform to share and discuss the problems they encounter while they are teaching. The most important reason for the opening of these forums was to sharing of the problems that computer teachers have in common and to let the policy makers know these problems. Participation to these

online forums was voluntary and the researcher did not make any effort to get computer teachers to involve in the discussions. A total of 2 online forums and 1266 messages were analyzed, and each online forum has different number of postings and anonymous participants. The number of the postings and the participants of online discussion forums is detailed in Table 3.3.

Table 3.3. Number of Postings and the Participants in Online Asynchronous Discussion Forums

Forum No	# of Postings	# of Participants
1[a]	739	200
2[b]	527	348
Total	**1266**	**548**

Note: Since in each online asynchronous forum, there are different discussion parts related to the occupational problems of computer teachers; the total number of postings for each forum indicates the total number of messages acquired from different discussion parts of the same forum.

a. http://www.forum.memurlar.net, b. http://www.bilgisayarbilisim.net

In addition to the analysis of the content of forum messages, online news and paper news were also analyzed as a data source to provide further evidence to investigate research problems. A total of 21 pieces of news about computer education and its implementations in schools were analyzed.

3.3.3. Instruments Validity and Reliability

The quality of instruments used in a study is very important in order to draw valid and reliable conclusions based on the information collected in the study (Fraenkel

& Wallen, 2006). The term validity can be described as "the appropriateness, meaningfulness, correctness, and usefulness of the inferences" while the term reliability can be defined as "the consistency of scores or answers from one administration of an instrument to another, and from one set of items to another" (Fraenkel & Wallen, 2006, p. 150).

In the current study, as it is indicated in Table 3.4., the following criteria were applied to ensure the validity and reliability:

Table 3.4. Criteria for Ensuring Validity and Reliability

Strategy	Criteria
1. To ensure validity	1.1. The questionnaire was developed after a review of related literature.
	1.2. The questionnaire was examined and reviewed by peers and experts.
	1.3. A pilot study was conducted before the actual data collection process to clarify the researcher's biases.
	1.4. The questionnaire was checked by a Turkish language expert for the clarity of language.
	1.5. Each question in the questionnaire was designed to include just one thought.
2. To ensure reliability	2.1. The questionnaire was developed after a review of related literature.
	2.2. A pilot study was conducted to check the reliability of the questionnaire.
	2.3. The questions in the questionnaire were relevant to the purpose of the study

3.4. Procedures of the Study

In this study, the perceptions of computer teachers regarding the policy and the actual implementation of the new computer education curriculum are explored. This study has not aimed primarily to evaluate the new computer education program to determine whether it is a better or worse program than the old one. Rather, it is a study of the new computer education curriculum to determine how the policy of computer education is implemented in schools, and whether there are any gaps between the policy stipulations and the existing school implementations. In this study, computer teachers are the main source of data; and how they perceive the new computer education in schools is the main focus of the study.

In the current study, both qualitative and quantitative research methods were used in a combination by mixing the elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration (Johnson, Onwuegbuzie, 2004; Johnson, Onwuegbuzie, Turner, 2007).

Based on mixed method research, firstly, quantitative data were collected and analyzed as the baseline data on the perceptions of computer teachers regarding the new computer education curriculum and its implementations in schools. After that, qualitative data were collected and analyzed; and this phase helped explain and make clear the quantitative results which were obtained previously. As Creswell (2003) affirms, quantitative data obtained in the first phase and their analysis provided a general understanding of the research problem under investigation; and subsequently, qualitative data and their analysis helped probe and explore these statistical results in more depth by explaining the participants' views and perceptions.

In this study, firstly, quantitative data was collected using a questionnaire for a preliminary analysis of computer teachers' perceptions regarding and attitudes

toward new computer education curriculum. Through this preliminary analysis, it was aimed to explore whether computer teachers have positive or negative attitudes toward new computer education curriculum, and to describe their perceptions regarding its implementation in schools.

To collect quantitative data, the Computer Teachers Questionnaire was distributed to computer teachers via e-mail and online forums of web sites that are frequently used by computer teachers, and their participation was requested by completing the questionnaire. The researcher sent personal e-mails to the computer teachers, and left messages to the online forums of web sites, requesting the participation of the computer teachers in the current study by completing the questionnaire and sending it back to the researcher. In this process, the participants were told that their participation was voluntary and their responses to the questionnaire would be confidential. Quantitative data and its statistical results provided a general understanding about how computer teachers think of the new curriculum and which problems they encounter in its implementations.

Secondly, qualitative data was collected and analyzed in order to explain and refine the results obtained through quantitative data in the first phase. In addition to the open-ended items in the questionnaire, qualitative data was collected through messages posted by computer teachers in online asynchronous discussion forums about the problems they encounter in their profession; and through online and paper news about computer education and the occupational problems of computer teachers. The analysis of the content of these forum messages and news helped portray the results of the quantitative data, and identify the certain factors affecting the participants' perceptions and thoughts which otherwise could not be obtained through quantitative items in the questionnaire. Furthermore, open-ended questions contained in the questionnaire were used to collect qualitative data.

In this study, although the questionnaire was used as the primary data collection tool, data obtained through questionnaire and its statistical results were limited to represent the whole picture and explain the research questions in depth. Therefore,

the results of quantitative data were complemented and confirmed by qualitative data obtained through online forum messages and news about the research problems.

The procedure used in the study is summarized in Table 3.5.

Table 3.5. Procedures of the Study

Type of Research Method	Procedure
1. Quantitative Data Collection	1.1. Develop the questionnaire 1.2. Peer and expert review 1.3. Language clarity check 1.4. Conduct pilot study 1.5. Distribute questionnaire 1.6. Coding collected data 1.7. Enter data in to SPSS 1.8. Analyze the statistical results 1.9. Write interpretations
2. Qualitative Data Collection	2.1. Collect online forum messages 2.2. Collect online and paper news 2.3. Analyze collected data 2.4. Write interpretations

3.5. Analysis of Data

This research study was conducted in order to examine the current status of computer education in Turkish basic education schools by exploring the

perceptions of computer teachers in terms of policy of new computer education curriculum and its actual implementations in schools. For this purpose, a mixed method research approach is employed as the primary research method for the study in order to combine both quantitative and qualitative research methods to have a broader and deeper understanding of the issues under investigation.

According to Tashakkori and Teddlie (1998), "in survey research, there is often a combination of open-ended and close-ended response options…. These close-ended responses are analyzed statistically, and the open-ended responses are content analyzed" (p.128). In much of the educational research, it is a hallmark to collect both quantitative and qualitative data concurrently (Tashakkori & Teddlie, 1998). In this research, quantitative data were analyzed through the descriptive and inferential statistics, and the qualitative data were analyzed through the content analysis.

3.5.1. Quantitative Data Analysis

In order to investigate the current status of computer education through describing and summarizing the essential characteristics of the collected data, the descriptive statistics (percentiles, means, frequency distributions, standard deviations, etc.) were used (Johnson & Christensen, 2004). The data collected through the questionnaire items were coded and prepared for analysis by using SPSS (Statistical Package for the Social Sciences) software.

Inferential statistics were used to make inferences based on the collected data (Fraenkel & Wallen, 2006; Johnson & Christensen, 2004). For this purpose, independent-samples t-test and one-way Analysis of Variance (ANOVA) were performed in order to investigate whether there are significant differences between independent variables (IVs) and dependent variables (DVs) (Green & Salkind, 2005). Both analyses included two independent variables and one dependent variable as the following:

Independent variables:

Gender:

It is a categorical variable with two levels (1 = female and 2 = male).

Work experience:

It is a categorical variable with four levels (1 = between 1 and 3 years, 2 = between 4 and 6 years, 3 = between 7 and 9 years, and 4 = 10 years and more).

Dependent variable:

Perceptions of computer teachers regarding the policy of new computer education curriculum and its current implementations in schools:

It is a continuous variable with five levels (1 indicating "Completely Disagree", 2 indicating "Disagree", 3 indicating "Neutral", 4 indicating "Agree", and 5 indicating "Strongly Agree") and it contains three sub-scales. The first sub-scale is the recognition and application of new computer education curriculum; the second sub-scale is current changes in computer education due to the decrease in course hour; and the third sub-scale is current changes in computer education due to its being an elective course.

On the first sub-scale, higher scores are associated with higher levels of positive perceptions regarding the recognition of new computer education curriculum. On the second sub-scale, higher scores are associated with higher levels of negative perceptions regarding the changes brought about as a result of the decrease in the duration of course hour in computer education. On the third sub-scale, higher scores are associated with higher levels of negative perceptions regarding the changes brought about as a result of the computer education being an elective course.

3.5.2. Qualitative Data Analysis

In order to analyze the qualitative data, the content analysis technique was utilized. Content analysis can be defined as "a research technique for the objective, systematic, and the quantitative description of the manifest content of communication" (Berelson, 1952, p.18). As Rourke and Anderson (2004) suggest, this quantitative description process includes segmenting communication content into units, assigning each unit to a category, and providing tallies for each category.

As for the analysis of open-ended items in the questionnaire, the model proposed by Miles and Huberman (1994) was used, which includes three steps as data reduction, data display, and conclusion drawing and verification. In this process, data obtained through the open-ended items were coded into categories which were pre-determined based on the research questions. After that, data was organized into displays. Finally, conclusions were drawn and verified based on the data displays.

As Hara, Bonk, and Angeli (2000) stated there is no standard model for the content analysis of computer-mediated communication; therefore, for the analysis of the content of the messages posted by computer teachers in online asynchronous discussion forums, and for the analysis of content of online and paper news; the model, which they suggested based on the Henri's (1992) model for content analysis of computer-mediated communication, was employed. This model includes gathering firstly quantitative information about the number and the types of the forum messages, and then gathering qualitative information about the content of these messages.

In this study, for the analysis of the content of the online forum messages and news, initially a deductive approach was used in order to identify each forum message or piece of news into pre-determined categories. These pre-determined categories were extracted based on the sub-scales of the questionnaire. In other

words, initially, the content of the online forum messages and news were intended to be identified into the following categories:

(1) Recognition and application of new computer education curriculum

(2) Current changes in computer education due to the decrease in the course hour

(3) Current changes in computer education due its elective course status

However, after multiple readings of messages and news, it was recognized that using an inductive approach was more appropriate to categorize each forum message or news; therefore, the pre-determined categories were modified and new categories were derived in accordance with the emerging data set.

3.6. Threats to Internal Validity

Identifying possible threats to internal validity during the planning stage is an essential step in carrying out a research study (Fraenkel & Wallen, 2006). “When a study has internal validity, it means that any relationship observed between two or more variables should be unambiguous as to what it means rather than being due to ‘something else’” (Fraenkel & Wallen, 2006, p.169). Hence, before conducting any research, possible threats should be considered, and ways of eliminating or at least minimizing these threats should be designed.

In this study, there were some threats to internal validity as a result of the nature and limitations of the study. The threats to internal validity and how they were eliminated or minimized, if possible, could be listed as in the following:

3.6.1. Subject Characteristics Threat

The selection of participants for a study may result in individuals who are different from each other in unintended ways (age, gender, ability and other

variables), which could affect the results of the study. This is referred to as subject characteristics threat (Fraenkel & Wallen, 2001, 2006).

In this study, data was collected from the sample of computer teachers, who were different from one another in terms of age, maturity, gender, intelligence, ability, attitude, socioeconomic background, and political beliefs. In this study, the most noticeable difference among the sample of computer teachers was the gender of the individuals. The gender of the teachers was a threat for this study because female and male teachers could interpret the same situation from a different perspective. While female computer education teachers approach their job (teaching) from an emotional perspective, male computer education teachers usually see their job as a technical issue and they prefer not to use their emotions in their work. This situation may affect their perceptions regarding their implementation of new computer education curriculum. In this study, since data was collected through online questionnaires from volunteers, gender of the computer teachers could not be controlled; and equal number of male and female computer teachers could not be surveyed.

3.6.2. Location Threat

The particular locations, in which data is collected, may create defensible alternative explanations for the results of the research study; which is referred to as location threat (Fraenkel & Wallen, 2001, 2006).

In this study, data were gathered from the samples through online questionnaires. Hence, the locations in which data were collected were different for each sample; and this may affect the results of the study. However, since it was impossible to keep the location the same or constant for all samples, it seems there was nothing to do to control the location threat for this study.

3.6.3. History Threat

On occasion, one or more unanticipated or unplanned events may occur during the course of the study, and this situation may affect the responses of the individuals in the sample. Such an event, which may affect the results of the research, is referred to as a history threat (Fraenkel & Wallen, 2001, 2006).

In this study, data were collected during an eight-month time period from May to December; and the researcher did not have any control or intervention on the samples during this time period from the beginning until the end of the data collection process. During this time period, one or more unanticipated or unplanned events may have occurred related to the implementation of the new computer education curriculum; and this situation may affect the results of the study. Although this situation may create a history threat for the study, it was not possible to make sure that all samples had the same experiences before data collection process.

3.6.4. Authentication Threat

In the data collection process of this study; first of all, online questionnaires were utilized as a source of data, which creates a new threat to internal validity of the study. As mentioned before, these online questionnaires were conducted through the web sites that are frequently used by computer teachers. However, despite the researcher's intention to gather data from the computer teachers, it is not certain that these online questionnaires were filled in by the genuine computer teachers. In other words, even if it is assumed that the authentic computer teachers provided data through online questionnaires, there is no way to make sure that data collected from online questionnaires represents the reality. Although this situation creates a threat to internal validity of the study, the researcher has had no control to prevent this situation.

3.7. Delimitations & Limitations of the Study

(1) This study has confined itself to surveying the computer teachers working in basic education schools located in some provinces of Turkey. As stated before, the study has explored the perceptions of computer teachers regarding the new computer education curriculum and its implementations in schools. However, although the same content has been presented in the context of computer education courses in each school, students have been taught by a different computer teacher in each school. This situation may have changed the students' attitudes and motivation –and, in turn, their teachers' perceptions– toward the computer education. Therefore, data obtained from computer teachers may lead to some fluctuations.

(2) This study have used purposive sampling procedure in order to select information-rich cases whose study may illuminate the questions under study (Patton, 1990). However, the purposive sampling procedure decreases the generalizability of findings. So, the results of this study are limited with some basic education schools located in Turkey; therefore, the findings cannot be generalized beyond this study. In addition, the intended sample was not accessed completely because of the reluctance of computer teachers to take a part in the study. If more individuals made a contribution, the results of the study would be different. So, this consideration also limits the generalizability.

(3) Some of the participants failed to complete all of the questions, especially open-ended questions, in the questionnaire, which may create another validity threat. It was possible that the results would have been different, if all of the participants completed the whole questionnaire.

(4) Validity of this study is limited to the reliability of the instruments used to collect data as well as the honesty and sincerity of the participants while responding the questions in these instruments. Also, this study has some threats to internal validity, some of which cannot be controlled by the researcher.

(5) There could be some extraneous variables that might have effect on the results of the study during data collection procedure. For example, locations were different for each sample, each person had different personal characteristics, each sample had different experiences, etc.

(6) The pilot study was not conducted with enough participants and as a result this may restrict the validity and the reliability of the study.

3.8. Summary of the Chapter

In this chapter, the following issues were addressed:

(1) Research questions which guided the whole research methodology and procedures in this study.

(2) The research methodology (mixed method research approach) used to answer the research questions and the rationale for this methodology.

(3) The description of the participants of the study.

(4) The instruments used in the study, how these instruments were developed, and how these instruments were used to collect data.

(5) The summary of data collection process including how, when and where data were collected.

(6) The description of data analysis procedures.

(7) The issues of validity and reliability.

(8) The limitations and delimitations of the study.

CHAPTER 4

FINDINGS

This chapter demonstrates the findings of the study regarding the research questions and sub-questions stated formerly. In this chapter, firstly; descriptive information that was collected through the "Computer Teachers Questionnaire" is presented. After that, the perceptions of computer teachers concerning the new computer education curriculum are outlined followed by their thoughts about the changes brought about by the implementation of new curriculum in schools. Finally, responses to the open-ended questions in the questionnaire, and the qualitative data obtained through the analysis of the content of online forum messages and news about computer education are reported.

4.1. Demographic Information

4.1.1. Demographics of the Participants

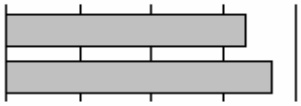
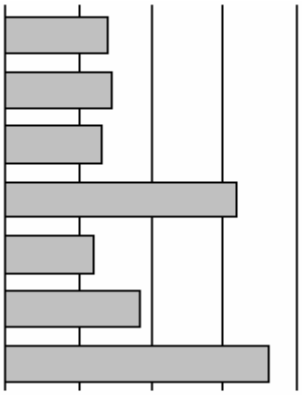
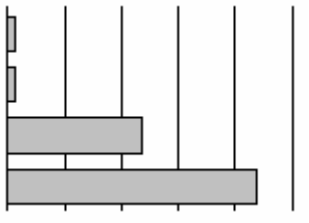
Demographic, which refers to the information identifying the characteristics of the participants, is important to elicit the perceptions of the participants and to understand the overall findings of the study (Patton, 2002). As a result, in the current study, descriptive information about the demographics of the participants was collected through a short section of the questionnaire.

As previously mentioned in the methodology section, the participants of this study consisted of a total of 350 in-service computer teachers working in basic education schools located in different provinces of Turkey. As it is illustrated in Table 4.1., 47.4 % (166) of computer teachers were male, whereas 52.6 % (184) of them were female, which indicates that similar number of participants from both gender were included in the study.

Considering the geographical regions, where computer teachers work, it is seen that nearly half of the participants of the study work in the Marmara Region and the Middle Anatolia Region with the proportions of 25.7 % and 22.6 %, respectively. As it is demonstrated in Table 4.1., these two regions are followed sequentially by the Aegean Region (13.1 %), East Anatolia Region (10.6 %), South Anatolia Region (10.0 %), Black Sea Region (9.4 %), and Mediterranean Region (8.6 %).

As it is presented in Table 4.1., 62.6 % (219) of computer teachers have teaching experience between 1 and 3 years, and 33.4 % (117) of them have teaching experience between 4 and 6 years. On the other hand, only 4 % (14) of the computer teachers indicated that they have teaching experience more than 7 years. The results showed that teaching experience of computer teachers who participated in this study is mainly ranged from 1 year to 6 years. Since the departments which educate computer teachers have relatively short history in Turkey, their graduates have been performing as computer teachers in the past 6 or 7 years since 2002 (Çakır, 2008). Computer teachers who have teaching experience more than 7 years are usually the ones who have graduated from other disciplines and become computer teachers later on.

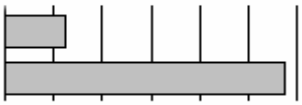
Table 4.1. Demographics of the Participants

Gender of the participants	**F**	**%**	**Frequency bar graph**
Male	166	47.4	
Female	184	52.6	
Mode: Female			
Geographical areas	**F**	**%**	**Frequency bar graph**
South Anatolia Region	35	10	
East Anatolia Region	37	10.6	
Black Sea Region	33	9.4	
Middle Anatolia Region	79	22.6	
Mediterranean Region	30	8.6	
Aegean Region	46	13.1	
Marmara Region	90	25.7	
Mode: Marmara Region			
Teaching experience	**F**	**%**	**Frequency bar graph**
More than 10 years	7	2	
Between 7 and 9 years	7	2	
Between 4 and 6 years	117	33.4	
Between 1 and 3 years	219	62.6	
Mode: Between 1 and 3 years			

As it is shown in Table 4.2., of 350 computer teachers, 82.6 % (289) indicated that they like being a teacher and they enjoy teaching in computer education, while

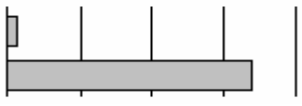
17.4 % (61) stated that they do not like their job and they do not take any pleasure from teaching in computer education.

Table 4.2. Liking in Computer Teaching

Liking of teaching	F	%	Frequency bar graph
Dislike being a computer teacher	61	17.4	
Like being a computer teacher	289	82.6	
Mode: Like being a computer teacher			

Considering the type of schools where the computer teachers who participated in this study work, the results in Table 4.3. indicated that while majority of the teachers (96.6 %) work in state basic education schools, only a small portion of them (3.4. %) work in private basic education schools.

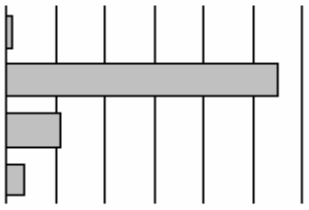
Table 4.3. School Types of Computer Teachers

School type	F	%	Frequency bar graph
Private basic education school	12	3.4	
State basic education school	338	96.6	
Mode: State basic education school			

The results of the questionnaire revealed that almost all computer teachers (99.4 %) have at least one computer laboratory at their schools with the exception of only 0.6 % (2) of them, who indicated that they do not have any computer laboratories at their schools. As it is illustrated in Table 4.4., 78.9 % (276) of computer teachers reported that they have only one computer laboratory, 15.4 % (54) have two computer laboratories, and 5.1 % (18) have three or more computer laboratories at their schools.

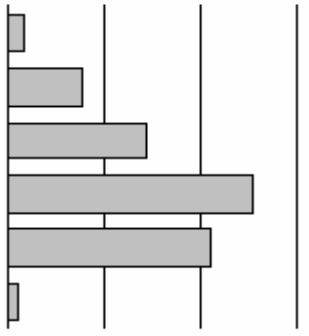
Table 4.4. ICT Facilities of Schools

Number of computer laboratories allocated for computer education

#	F	%	Frequency bar graph
0	2	0.6	
1	276	78.9	
2	54	15.4	
3 or more	18	5.1	

Mode: 1

Number of computers allocated for student use in computer laboratories

#	F	%	Frequency bar graph
Fewer than 5	5	1.4	
Between 6 and 10	38	10.9	
Between 11 and 15	72	20.6	
Between 16 and 20	127	36.3	
More than 21	106	30.3	
No laboratories	2	0.6	

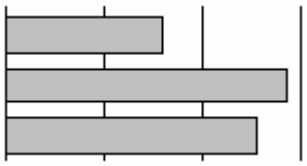
Mode: Between 16 and 20

When the number of computers allocated for the use of students in computer education courses was investigated, as it is demonstrated in Table 4.4, it was found that 30.3 % (106) of schools have computer laboratories with more than 21 computers, 36.3 % (127) with between 16 and 20 computers, 20.6 % (72) with between 11 and 15 computers, 10.9 % (38) with between 6 and 10 computers, and 1.4 % (5) with fewer than 5 computers.

4.1.2. Workload of Computer Teachers

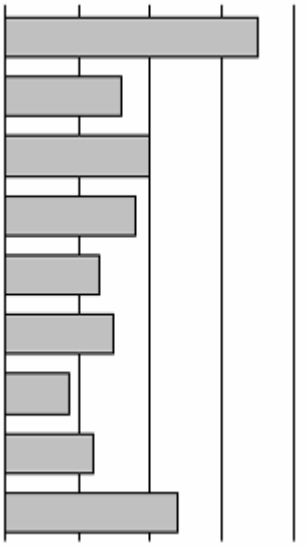
Regarding the workload of the computer teachers, who participated in this study, the results showed that more than half of the computer teachers (63.4 %) are not able to complete their compulsory working hours in teaching in computer education course. According to the law of MoNE (2006b) concerning the workloads of teachers (Law No: 1/12/2006-2006/11350), a computer teacher has to work at least 15 hours a week. As it is illustrated in Table 4.5., 22.6 % (79) of computer teachers work less than 10 hours a week, 40.9 % (143) work between 10 and 15 hours a week, and 36.6 % (128) work 16 hours or more a week.

Table 4.5. Weekly Workload of Computer Teachers in Computer Education

Weekly working hours	F	%	Frequency bar graph
Fewer than 10 hours	79	22.6	
Between 10 and 15 hours	143	40.9	
16 hour and more	128	36.6	
Mode: Between 10 and 15 hours			

Of the computer teachers, whose teaching workload in computer education is less than 15 hours a week, 47.3 % (105 of 222) stated that, in order to complete their compulsory working hours, they are assigned to teach in courses other than computer education by school administration. On the other side of the spectrum, of the computer teachers who are able to complete their compulsory teaching workload in computer education, only 5.5 % (7 of 128) stated that they teach in other courses at their own will because of their desire for earning extra money.

Table 4.6. Courses Computer Teachers Teach Other than Computer Education

Courses	F	%	Frequency bar graph
Elective Courses	35	21.6	
Visual Arts Course	16	9.9	
Technology and Design Course	20	12.3	
English Language Teaching Course	18	11.1	
Science and Technology Course	13	8.0	
Physical Education Course	15	9.3	
Religion and Morals Course	9	5.6	
Mathematics Course	12	7.4	
Music Course	24	14.8	
Mode: Elective Courses			

Note: Since participants were allowed to choose more than one course, one participant has more than one frequency contribution to overall frequency of each different course; and the total number of selection is 162 although 112 computer teachers stated they teach in courses other than computer education.

As stated before, when the computer teachers are not able to complete their compulsory teaching hours in computer education, they are obligated to teach in other courses. The results of the questionnaire showed that although some computer teachers teach only in one another course other than computer education, some are required to teach in two or more other courses. Considering these courses, as it is demonstrated in Table 4.6., most of the computer teachers are assigned to teach in elective courses (including First Aid and Traffic Education, Chess Education, Media Literacy Education, Art Activities, Guidance/Counseling and Social Activities), and Music Education Course with frequencies of 35 (21.6 %) and 24 (14.8.%), respectively.

4.2. Teaching and Learning Methods Used in Computer Education

To investigate which teaching and learning strategies are used in computer education courses by the teachers who participated in this study, computer teachers were asked to complete a listing table by selecting teaching methods they use in their instruction. In this section of the questionnaire, teachers were required to compare the teaching methods they were able to use when computer education was two hours a week with the ones they use after it was decreased to one hour a week. According to the results obtained in this part of the questionnaire, it is obvious that the length of the computer education course is an important determinant for the selection of the teaching and learning methods used in instruction.

As it is illustrated in Table 4.7., relatively big changes have occurred in the teaching and learning methods after the length of computer education course has been decreased from two hours a week to one hour a week. As it is seen in Table 4.7., while group working (90.3 %), project-based learning (83.2 %), and demonstration (82.3 %) were the most frequently used teaching methods when computer education was two hours a week; lecturing (94.6 %), question & answer (85.7 %), and demonstration (74.0 %) are the most frequently used teaching and learning methods after the change in the length of the computer education course.

Table 4.7. Change in Teaching and Learning Activities in Computer Education

Teaching and learning method	2 Hours a week		1 Hour a week		Change			
	F	%	F	%	F		%	
Demonstration	288	82.3 %	259	74.0 %	↓	29	↓	8.3
Group working	316	90.3 %	82	23.4 %	↓	234	↓	66.9
Project-based	291	83.2 %	45	12.9 %	↓	246	↓	70.3
Lecturing	174	49.7 %	331	94.6 %	↑	157	↑	44.9
Role playing	158	45.2 %	12	3.3 %	↓	146	↓	41.9
Brainstorming	261	74.6 %	51	14.6 %	↓	210	↓	60.0
Question and answer	284	81.2 %	300	85.7 %	↑	16	↑	4.5
Multiple intelligence	193	55.1 %	24	6.8 %	↓	169	↓	48.3
Discovery-based	265	75.7 %	45	12.8 %	↓	220	↓	62.9
Constructivist	194	55.4 %	36	10.2 %	↓	158	↓	45.2
Problem-based	260	74.3 %	52	14.8 %	↓	208	↓	59.5

To discover the reasons why computer teachers have changed the way they taught and why they have began to use different teaching and learning methods in their courses, an open-ended item was included in the questionnaire. Through this open-ended item in the questionnaire, computer teachers were asked to write their reasons for changing their instructional methods and any opinions about this issue.

Of the 350 participants in the study, 268 (76.6 %) answered the open-ended item by stating why there was a change in the way they taught. The responses to this question were compiled and analyzed to identify any themes related to the reasons for the change. The analysis of responses revealed that almost all of the computer teachers, who answered this open-ended item, believed that the most important reason was the limited course time allocated for computer education.

Of the 268 participants, 254 (94.8 %) stated that the length of the course time was not enough and they were restricted to use learning and teaching methods which could be completed in short time periods.

One computer teacher remarked this common perceived theme by stating:

> *"It is a very tiring and hard work to teach in computer education course, which is like a quick-action movie. In such a limited time, it is impossible to use instructional methods like group working which require much longer time. And, even it is impossible to learn the names of students in such a limited time, which makes it difficult for me to communicate effectively with them."*

Another computer teacher noted this situation by stating:

> *"When the duration of computer education course was two hours a week, it was much easier to transfer the knowledge to students by using different instructional methods for different student groups. Now, the time is very limited, and I have to use such methods as lecturing and demonstration, so that I can explain the topic quickly."*

Moreover, almost all of the computer teachers (N=241) indicated that since course time is very limited, they have to spend much of the time themselves presenting the subject and transferring the theoretical knowledge; therefore, there is so little time left so that students can gain practical experience with computers, which is very crucial for computer education. In addition, they explained that this situation has decreased the effectiveness and efficiency of computer education course, which in turn has decreased the success of the students.

The following excerpt is one of the examples about this issue:

> *"... Since time is limited, there is not much time for students to apply what they have learnt on computer. So, I give them some homework so that they can complete some activities in their leisure time outside of school; however, this creates another problem for students who do not have computers at home. I think, this situation decreases the effectiveness of the computer education; but this is the best I can do."*

Another computer teacher explained the situation as follows:

> *"... In computer education, hands-on experience is very important; however, it seems impossible in such a limited time as one hour a week. Everyone knows that when the theoretical knowledge turns into practical experience, learning becomes much more permanent; however, the duration of computer education is not enough to provide students with enough hands-on experience. It is not important what your job is; you can be a doctor, an engineer, or a lawyer. You always need ICT skills; and it is very hard to acquire such skills in such a limited time period allocated for computer education."*

The views of another computer teacher about this issue are as the following:

> *"... The limitation on the course hours has made it impossible to expect efficiency in computer education. As all other computer teachers, I try to give students much more information in a much shorter time; and unfortunately the result is a complete failure."*

Besides these, many of the computer teachers (N=236) believe that with the decrease in the course hour, they are unable to use such methods to check the readiness of the students and motivate them towards the lesson at the beginning, and such methods to evaluate the students' learning at the end.

For example, a computer teacher declared this situation as the following:

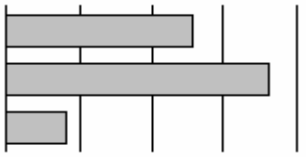
> *"Before, when computer course was two hours a week, I was able to use different strategies in my instruction. For example, before teaching any new topic, I was always checking the readiness of my students to learn new subject by asking them some questions or by preparing some kinds of activities. However, with the decrease in the course hour, it is very difficult for me to use such kinds of methods."*

Another computer teacher explained his ideas about this issue as:

> *"… It is impossible for me to do much in such limited time…. Now, I usually explain the topic by using such simple methods as lecturing and demonstration, and I hardly find time to evaluate the students' learning and to get feedback from the students to check if they really understood it or not. I am not happy with this situation; however, I have nothing to do…"*

The analysis of responses of the computer teachers to the open-ended item, which explored the reasons for the change in instructional methods, revealed another important factor which prevents the teachers from using teaching and learning methods taking longer times. Most computer teachers indicated that getting students ready for the lesson takes some time; and this also limits their instructional time. This important factor was confirmed by the responses of all computer teachers, who participated in the study, to the item in the questionnaire asking how much time they spend to get students ready for the lesson. As it is illustrated in Table 4.8., of the 350 computer teachers, 129 (36.9 %) indicated that they spend between 1 and 5 minutes, 181 (52.7 %) spend between 6 and 10 minutes, 40 (11.4 %) spend more than 10 minutes.

Table 4.8. Time Spent for Getting Students Ready for Lesson

Time spent	F	%	Frequency bar graph
Between 1 and 5 minutes	129	36.9	
Between 6 and 10 minutes	181	52.7	
11 minutes and more	40	11.4	
Mode: Between 6 and 10 minutes			

According to the results of the study, most computer teachers (N=215) claimed that since the computer education courses take place in a computer laboratory, its nature is very different from the other courses like mathematics or science education. They believe that motivating students and attracting their attention to the course is very difficult in a computer laboratory because in such an environment students even forget the presence of a teacher and their only aim is to use computers. As a result, computer teachers stated that most students are indifferent to the computer education course, and they do not even want to listen to the teacher.

One computer teacher argued these difficulties in computer education as the following:

> *"... As all teachers, I spent some time to get my students ready for the lesson. Since I deliver my courses in a computer laboratory, it is more difficult for me, and I need more time for preparation. The settlement of students on their places takes some time, and attracting their attention and motivating them takes some time, too. After that, there is a little time left to explain the topic, so I usually use such methods as lecturing which enable me to complete the activities quickly..."*

Another computer teacher explained her views as:

> *"In such a limited time, I think even the simplest teaching methods are ineffective. Sometimes, students are so indifferent to the computer course and they do not care very much what I say; so it is very difficult to have authority in the class. As a result, I need to spend so much time to motivate students that there is little or no time to complete the activities I have planned beforehand."*

Some computer teachers (N=113) noted that the lack of technical infrastructure and the drawbacks of computer laboratories in schools also affect the preparation time for lesson, which in turn deteriorates the time limitation of computer education course. Computer teachers also complained that the lack of technical infrastructure of schools also creates another big problem about the classroom discipline. Since in most schools, classes are relatively overcrowded, two or three students have to share the same computer, which makes it very difficult for teachers to remain the classroom discipline.

The following excerpt is one of the best examples to explain this situation:

> *"... In my computer laboratory, almost all computers are out-dated and they use first version of the operating system. Since all machines are old, it takes 5-10 minutes to booting them up. I spend another 5-10 minutes to restore classroom discipline, and motivate and silence students. As a result, I already spend half of the class time. So, how can you expect me to use teaching methods which take long time?"*

The views of another computer teacher are as following:

> *"I work in a school where there are approximately 40-45 students in each class. In my computer laboratory, there are only 15 computers and almost all of them are out-dated. Since the number of computers is*

insufficient, three students have to share the same computer, and they are always in a battle with each other in order to use the computer more. In such a situation, it becomes impossible for me to control the students and motivate them; so I have to spend so much time to restore the classroom discipline."

Of the 268 participants, who answered the open-ended item asking the reasons for the change in instructional methods, 14 (5.2 %) stated that they have not changed the way they taught with the decrease in course hour; however, they stated that there is little time left for students to turn their theoretical knowledge into practical experience, and they expressed that they are not able to provide students with much opportunity to gain hands-on experience with computers.

One of the computer teachers remarked this perceived theme by stating:

"Well, if I honestly speak, there is not much change in the way I teach. However, since time is limited, I usually try to use time more efficiently and I usually allocate less time to explain the subject and I give fewer examples related to the topic. As a result, students have problems in fully comprehending the subject, and there is not much time for students to gain practical experience with computers."

4.3. Perceptions of Computer Teachers Regarding the Policy of New Computer Education Curriculum and Its Implementations in Schools

As it is aforementioned, this research study was designed to investigate the current status of computer education in Turkish basic education schools by exploring the perceptions of computer teachers in terms of the policy of new computer education curriculum and its actual implementations in schools.

In this study, computer teachers were asked about their perceptions regarding new computer education curriculum through the "Computer Teachers Questionnaire",

which included both qualitative and quantitative data collection sections. As it has been mentioned in the earlier section, the data collection instrument includes three main sections, each of which was utilized to collect different kinds of data from the participants.

Within the "Computer Teachers Questionnaire", a perception section was utilized to investigate how computer teachers perceive the new computer education curriculum. Through this section, participants were asked to rate their levels of agreement with each of the statements by using a five-point Likert-type scale including the alternatives "Strongly Agree (SA)", "Agree (A)", "Neutral (N)", "Disagree (D)", and "Strongly Disagree (SD)". All Likert-type items in this section were grouped around three factors (sub-scales) as the following:

(1) Recognition and application of new computer education curriculum

(2) Current changes in computer education due to the decrease in course hour

(3) Current changes in computer education due to its being an elective course

The questions related to these sub-scales are grouped as the following:

(1) Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q11

(2) Q9, Q10, Q12, Q13, Q14, Q15, Q16, Q17, Q18, Q19, Q20, Q21, Q22

(3) Q23, Q24, Q25, Q26, Q27, Q28, Q29

The statistical results for the perceptions of computer teachers were detailed in Table 4.9. As it is illustrated in the table, computer teachers' perceptions ranged from 3.08 (i.e. 11^{th} item in the first sub-scale) to 4.68 (i.e. 16^{th} item in the second sub-scale and 27^{th} item in the third sub-scale), and the overall mean score for the whole perception scale including 29 items was M= 4.30.

Table 4.9. Descriptive Statistics of the Perceptions of Computer Teachers on the Likert-type Items in the Computer Teachers Questionnaire

Sub-scales	# of Items	Mean	Std. Deviation	Alpha Coefficient
Recognition and application of new computer education curriculum	9	3.82	0.50	0.83
Current changes in computer education due to the decrease in course hour	13	4.45	0.48	0.91
Current changes in computer education due to its being an elective course	7	4.62	0.55	0.93
Overall	29	4.30	0.37	0.91

In order to confirm and clarify the results presented in Table 4.9., perceptions of computer teachers were examined in detail as in the following:

4.3.1. Perceptions of Computer Teachers Regarding the Recognition and Application of New Computer Education Curriculum

The 9 items in the "Recognition and Application of New Computer Education Curriculum" sub-scale were utilized in order to explore:

(1) How is new computer education curriculum recognized by the computer teachers who participated in this study?

(2) What kind of changes computer teachers have experienced with the implementation of new computer education curriculum?

To discover the level of computer teachers' perceptions on each item of the first subscale, descriptive statistics were utilized. That is, for each item on the

"Recognition and Application of New Computer Education Curriculum" sub-scale; as it is illustrated in Table 4.10., means and standard deviations were calculated, and the distributions of responses on five-point rating scale (SA, A, N, D, SD) were obtained (See Table 4.11.). In this perception sub-scale, items were coded in such a way that higher mean scores were associated with higher levels of positive perceptions regarding the recognition of new computer education curriculum.

Table 4.10. Mean and Standard Deviation Scores of Computer Teachers' Responses on the Items Relating to "Recognition and Application of New Computer Education Curriculum"

Item Statement	Mean	Std. Deviation
Q1. Yeni öğretim programı bir önceki programa göre öğretmenler açısından uygulaması daha kolay bir programdır.	4.08	0.68
Q2. Yeni öğretim programı ile uygulamaya getirilen basamak ve seviyelendirme sistemi öğretim programının uygulanmasında kolaylık sağlamaktadır.	4.11	0.65
Q3. Yeni öğretim programı eski programda olmayan birçok yeniliği beraberinde getirmiştir.	4.07	0.73
Q4. Yeni öğretim programı zengin öğretim yöntemlerini içermekte ve bu sayede öğretmene programın uygulanmasında kolaylık sağlamaktadır.	3.76	0.71
Q5. Yeni öğretim programı, dersi işlerken öğretmeni yönlendirmede (rehberlik etmekte) olumlu özelliklere sahiptir.	3.99	0.69
Q6. Yeni öğretim programı, öğrencilerin günlük yaşamında kullanabilecekleri kazanımlara yer vermektedir.	3.89	0.69
Q7. Yeni öğretim programının içeriği öğrenciler için uygun değildir.	3.71	0.78
Q8. Yeni öğretim programı, içerdiği zengin öğretim yöntem ve teknikleri ile öğretmenlere dersi işlerken esneklik sağlamaktadır.	3.69	0.73

Table 4.10. (Continued)

Item Statement	Mean	Std. Deviation
Q11. Yeni öğretim programı hazırlanırken, programın gerçek uygulayıcıları olan öğretmenlerin ve öğrencilerin ihtiyaçları göz ardı edilmiştir.	3.08	1.08
Sub-scale Overall	3.82	0.50

Based on the responses to the items in the first sub-scale, it is seen that item Q2 (i.e. "Yeni öğretim programı ile uygulamaya getirilen basamak ve seviyelendirme sistemi öğretim programının uygulanmasında kolaylık sağlamaktadır.") has the highest mean score (M=4.11, SD=0.65), while the item Q11 (i.e. "Yeni öğretim programı hazırlanırken, programın gerçek uygulayıcıları olan öğretmenlerin ve öğrencilerin ihtiyaçları göz ardı edilmiştir.") has the lowest mean score (M=3.08, SD=1.08). When standard deviations are investigated, it can be seen that item Q11 has a standard deviation higher than 1.00, while all other items have standard deviations lower than 1.00. This means that item Q11 deviates more than the others.

Table 4.11. Distributions of Responses on Items Relating to "Recognition and Application of New Computer Education Curriculum"

Item Statement	SA	A	N	D	SD
	%	%	%	%	%
	F	F	F	F	F
Q1. Yeni öğretim programı bir önceki programa göre öğretmenler açısından uygulaması daha kolay bir programdır.	23.7	64.3	8.9	2.9	0.3
	83	225	31	10	1

Table 4.11. (Continued)

Item Statement	SA	A	N	D	SD
	%	%	%	%	%
	F	F	F	F	F
Q2. Yeni öğretim programı ile uygulamaya getirilen basamak ve seviyelendirme sistemi öğretim programının uygulanmasında kolaylık sağlamaktadır.	24.0	66.6	6.6	2.6	0.3
	84	233	23	9	1
Q3. Yeni öğretim programı eski programda olmayan birçok yeniliği beraberinde getirmiştir.	26.0	57.7	13.7	2.0	0.6
	91	202	48	7	2
Q4. Yeni öğretim programı zengin öğretim yöntemlerini içermekte ve bu sayede öğretmene programın uygulanmasında kolaylık sağlamaktadır.	11.7	57.1	27.1	3.7	0.3
	41	200	95	13	1
Q5. Yeni öğretim programı, dersi işlerken öğretmeni yönlendirmede (rehberlik etmekte) olumlu özelliklere sahiptir.	18.6	66.6	11.4	2.6	0.9
	65	233	40	9	3
Q6. Yeni öğretim programı, öğrencilerin günlük yaşamında kullanabilecekleri kazanımlara yer vermektedir.	14.0	66.0	15.7	4.0	0.3
	49	231	55	14	1
Q7. Yeni öğretim programının içeriği öğrenciler için uygun değildir.	1.4	6.3	21.4	61.4	9.4
	5	22	75	215	33
Q8. Yeni öğretim programı, içerdiği zengin öğretim yöntem ve teknikleri ile öğretmenlere dersi işlerken esneklik sağlamaktadır.	8.6	58.6	27.4	4.6	0.9
	30	205	96	16	3
Q11. Yeni öğretim programı hazırlanırken, programın gerçek uygulayıcıları olan öğretmenlerin ve öğrencilerin ihtiyaçları göz ardı edilmiştir.	9.1	22.9	23.4	40.3	4.3
	32	80	82	141	15

As it is illustrated in Table 4.10., the perceptions of computer teachers on each item on the first sub-scale, except the item Q11, indicate relatively high levels of perception, which is confirmed with high mean scores. As for the item Q11, it is seen that computer teachers were undecided/neutral (M=3.08, SD= 1.08) about whether the needs of them, as well as those of students, had been taken into consideration when the new computer education curriculum was constructed.

As it is shown in Table 4.12., the responses of computer teachers to the items in the first sub-scale reveal their overall agreement on the positive aspects of the new computer education curriculum, where the overall mean for this sub-scale is 3.82. However, it is important to note that since the items Q7 and Q11 were negatively worded, the agreement level for these items are relatively low, which is indicating positive perceptions when they were reworded in the reverse way.

Table 4.12. Agreement Level of Computer Teachers on the Items Relating to "Recognition and Application of New Computer Education Curriculum"

Item	Agreement (SA+A)		Perception
	F	%	
Q1	308	88.0	New computer education curriculum is easier to implement when compared with the old one.
Q2	317	90.6	The achievement levels used in the new curriculum makes the implementation of it easier.
Q3	293	83.7	New computer education curriculum has many novelties which did no exist in the old one.
Q4	241	68.8	New computer education curriculum includes various teaching methods and strategies; which makes the implementation of it easier for computer teachers.
Q5	298	85.2	New computer education curriculum has many positive aspects; and in this way it guides computer teachers.
Q6	280	80.0	New computer education curriculum includes learning objectives, which can be used in students' daily life.
Q7	27	7.7	The content of the new computer education curriculum is not acceptable for the students.
Q8	235	67.2	New computer education curriculum enables computer teachers more flexible through its various teaching methods and strategies.
Q11	112	32.0	The needs of computer teachers and students have been overlooked when preparing the new computer education curriculum.

As a result, computer teachers who participated in this study think that new computer education curriculum is easier to implement when it is compared with the old curriculum, especially through the system of achievement levels which could be considered as one of the novelties in the new curriculum. Furthermore, computer teachers think that the new curriculum includes various teaching methods and strategies, which provides them with the chance to be more flexible in the instructional process. In addition, the content of the new curriculum is perceived as including learning objectives which can be used by students in their daily life. However, computer teachers are neutral about whether the new curriculum was designed based on their needs or not.

4.3.2. Perceptions of Computer Teachers Regarding the Current Changes in Computer Education Due to the Decrease in Course Hour

The 13 items in the "Current Changes in Computer Education Due to the Decrease in Course Hour" sub-scale were utilized in order to explore:

> What are the perceptions of computer teachers regarding the changes that have occurred in computer education since the duration of the course hour was decreased to one hour a week at all grade levels in basic education schools?

To discover the level of computer teachers' perceptions on each item of the second subscale, descriptive statistics were utilized. That is, for each item on the "Current Changes in Computer Education Due to the Decrease in Course Hour " sub-scale; as it is illustrated in Table 4.13., means and standard deviations were calculated, and the distributions of responses on five-point rating scale (SA, A, N, D, SD) were obtained (See Table 4.14.). This perception sub-scale was reverse coded in order to ease the scoring and interpretation of the results. That is, items were coded in such a way that higher mean scores were associated with higher levels of negative perceptions regarding the changes brought about as a result of the decrease in the duration of course hour in computer education.

Table 4.13. Mean and Standard Deviation Scores of Computer Teachers' Responses on the Items Relating to "Current Changes in Computer Education Due to the Decrease in Course Hour**"**

Item Statement	Mean	Std. Deviation
Q9. Yeni öğretim programında yer alan etkinliklerin tamamlanması uzun zaman almaktadır.	4.19	0.57
Q10. Yeni öğretim programının içeriği planlanan zamanda bitirilebilecek şekilde tasarlanmıştır.	4.11	0.57
Q12. Bilişim Teknolojileri dersi için ayrılan süre gerekli olan bilgi ve becerilerin öğrencilere aktarılması için yeterlidir.	4.43	0.66
Q13. Ders saatlerinin azaltılması bilgisayar öğretmenlerinin zorunlu ders yüklerini doldurmalarını güçleştirmiştir.	4.57	0.70
Q14. Dersin 1 saate indirilmesi, öğretmenin ders işlerken kullandığı öğretim yöntem ve tekniklerini seçmede belirleyicidir.	4.32	0.71
Q15. Ders saatlerinin azaltılması öğrenciler üzerinde olumsuz bir etki yaratarak öğrencilerin derse olan ilgilerinin azalmasına sebep olmuştur.	4.39	0.80
Q16. Ders saatinin azalması nedeniyle öğrencilerin bilgisayar ile uygulama yapmaları için yeterli zaman kalmamaktadır.	4.68	0.65
Q17. Ders saatlerinin azaltılmasıyla birlikte diğer branş öğretmenleri arasında dersin önemsiz olduğu kanısı yaygınlaşmaktadır.	4.55	0.70
Q18. Ders saatlerinin azaltılmasıyla birlikte öğrenciler arasında dersin önemsiz olduğu kanısı yaygınlaşmaktadır.	4.56	0.71
Q19. Ders saatinin azaltılması bilgisayar öğretmenlerinin mesleki motivasyonları olumsuz etkilenmektedir.	4.57	0.68
Q20. Ders saatinin azaltılması, yapılandırmacı yaklaşımı benimseyen yeni müfredat açısından uygun değildir.	4.49	0.69
Q21. Öğrencileri derse hazır hale getirmek için belli bir zaman harcanması gerektiğinden dersin işlenmesi için gerekli zaman kalmamaktadır.	4.46	0.72
Q22. Ders saatinin azaltılmasından dolayı derste yeterince uygulama yapılamaması öğrencilerin başarılarını olumsuz etkilemektedir.	4.53	0.68
Sub-scale Overall	4.45	0.48

According to the responses to the items in the second sub-scale, it is seen that item Q16 (i.e. "Ders saatinin azaltılması nedeniyle öğrencilerin bilgisayar ile uygulama yapmaları için yeterli zaman kalmamaktadır.") has the highest mean score (M=4.68, SD=0.65), while the item Q10 (i.e. "Yeni öğretim programının içeriği planlanan zamanda bitirilebilecek şekilde tasarlanmıştır.") has the lowest mean score (M=4.11, SD=0.57). When standard deviations are investigated, it can be seen that all items have standard deviations lower than 1.00, which indicates that all of the responses to the items were close to the overall mean score for this sub-scale.

Table 4.14. Distributions of Responses on the Items Relating to "Current Changes in Computer Education Due to the Decrease in Course Hour"

Item Statement	SA	A	N	D	SD
	%	%	%	%	%
	F	F	F	F	F
Q9. Yeni öğretim programında yer alan etkinliklerin tamamlanması uzun zaman almaktadır.	26.3	68.0	4.9	0.6	0.3
	92	238	17	2	1
Q10. Yeni öğretim programının içeriği planlanan zamanda bitirilebilecek şekilde tasarlanmıştır.	0.3	0.6	8.9	68.6	21.7
	1	2	31	240	76
Q12. Bilişim Teknolojileri dersi için ayrılan süre gerekli olan bilgi ve becerilerin öğrencilere aktarılması için yeterlidir.	0.6	1.1	2.9	45.7	49.7
	2	4	10	160	174
Q13. Ders saatlerinin azaltılması bilgisayar öğretmenlerinin zorunlu ders yüklerini doldurmalarını güçleştirmiştir.	65.1	29.1	3.4	1.7	0.6
	228	102	12	6	2
Q14. Dersin 1 saate indirilmesi, öğretmenin ders işlerken kullandığı öğretim yöntem ve tekniklerini seçmede belirleyicidir.	42.6	49.1	6.3	1.4	0.6
	149	172	22	5	2
Q15. Ders saatlerinin azaltılması öğrenciler üzerinde olumsuz bir etki yaratarak öğrencilerin derse olan ilgilerinin azalmasına sebep olmuştur.	53.1	38.0	4.3	4.0	0.6
	186	133	15	14	2

Table 4.14. (Continued)

Item Statement	SA	A	N	D	SD
	%	%	%	%	%
	F	F	F	F	F
Q16. Ders saatinin azalması nedeniyle öğrencilerin bilgisayar ile uygulama yapmaları için yeterli zaman kalmamaktadır.	74.3	22.6	0.9	1.4	0.9
	260	79	3	5	3
Q17. Ders saatlerinin azaltılmasıyla birlikte diğer branş öğretmenleri arasında dersin önemsiz olduğu kanısı yaygınlaşmaktadır.	63.1	32.3	2.3	1.4	0.9
	221	113	8	5	3
Q18. Ders saatlerinin azaltılmasıyla birlikte öğrenciler arasında dersin önemsiz olduğu kanısı yaygınlaşmaktadır.	64.3	30.9	2.3	1.7	0.9
	225	108	8	6	3
Q19. Ders saatinin azaltılması bilgisayar öğretmenlerinin mesleki motivasyonları olumsuz etkilenmektedir.	64.9	30.0	3.1	1.4	0.6
	227	105	11	5	2
Q20. Ders saatinin azaltılması, yapılandırmacı yaklaşımı benimseyen yeni müfredat açısından uygun değildir.	58.0	34.3	6.3	1.1	0.3
	203	120	22	4	1
Q21. Öğrencileri derse hazır hale getirmek için belli bir zaman harcanması gerektiğinden dersin işlenmesi için gerekli zaman kalmamaktadır.	55.7	37.1	4.9	1.7	0.6
	195	130	17	6	2
Q22. Ders saatinin azaltılmasından dolayı derste yeterince uygulama yapılamaması öğrencilerin başarılarını olumsuz etkilemektedir.	60.3	35.7	1.4	2.0	0.6
	211	125	5	7	2

As it is illustrated in Table 4.13., the responses of the computer teachers to each item on the second sub-scale indicate high levels of negative perception, which is confirmed with high mean scores. As it is shown in Table 4.15., the responses to the items reveal an overall agreement of computer teachers on the current changes in computer education due to the decrease in the duration of course hour, which is clarified by the overall mean of the sub-scale (M=4.45). However, it is important to note that the items Q10 and Q12 were positively worded in meaning whereas all the other items were negatively worded. Therefore, responses to the items Q10

and Q12 indicate low levels of agreement, which in turn results in high levels of negative perceptions on these two items.

Table 4.15. Agreement Level of Computer Teachers on the Items Relating to "Current Changes in Computer Education Due to the Decrease in Course Hour"

Item	Agreement (SA+A)		Perception
	F	%	
Q9	330	94.3	It takes a long time to complete the activities in the new computer education curriculum.
Q10	3	0.9	New computer education curriculum was designed so that it could be completed in the planned length of time.
Q12	6	1.7	Time allocated for computer education is enough to transfer the related knowledge and skills to students.
Q13	330	94.3	Decrease in the course hour makes it more difficult for computer teachers to complete the compulsory working hours in teaching.
Q14	321	91.7	Decrease in the course hour has become a decisive factor in choosing which learning and teaching methods are used in instructional process.
Q15	319	91.1	Decrease in the course hour has resulted in a decrease in students' motivation toward computer education.
Q16	339	96.9	There is not enough time for students to gain hand-on experience on computers as a result of the decrease in the course hour.
Q17	334	95.4	Teachers in other subject areas think that computer education is not important due to the decrease in the course hour.
Q18	333	95.2	Students think that computer education is not important due to the decrease in the course hour.
Q19	332	94.9	Decrease in the course hour has lowered the professional motivation of computer teachers.

Table 4.15. (Continued)

Item	Agreement (SA+A)		Perception
	F	%	
Q20	323	92.3	Decrease in the course hour has created a contradiction with the idea that computer education course was designed based on the constructivist approach.
Q21	325	92.8	Since making students ready for lesson takes some time, there is not enough time left to deliver the content of the course.
Q22	336	96.0	Due to the decrease in course hour, there is not enough time for students to gain practical experience with computers, which affects the success of students adversely.

As a result, computer teachers who participated in this study believe that the decrease in computer education course hour has created some problems both for themselves and for students. They think that the limited time allocated for computer education is not enough to complete the learning activities in the new curriculum; and there is not enough time for students to gain practical experience with computers. In addition, they believe that decrease in the course hour has reduced the motivation and success of students. Furthermore, according to the responses, it is obvious that decrease in the course hour have resulted in the idea that computer education is not an important subject area for students.

4.3.3. Perceptions of Computer Teachers Regarding the Current Changes in Computer Education Due to Its Being an Elective Course

The 7 items in the "Current Changes in Computer Education Due to Its Being an Elective Course" sub-scale were utilized in order to explore:

What kinds of changes have occurred in computer education since it was declared as an elective course at all grade levels in basic education schools?

To discover the level of computer teachers' perceptions on each item of the third subscale, descriptive statistics were utilized. That is, for each item on the "Current Changes in Computer Education Due to Its Being an Elective Course " sub-scale; as it is illustrated in Table 4.16., means and standard deviations were calculated, and the distributions of responses on five-point rating scale (SA, A, N, D, SD) were obtained (See Table 4.17.). As the second sub-scale, this perception sub-scale was reverse coded in order to ease the scoring and interpretation of the results. That is, items were coded in such a way that higher mean scores were associated with higher levels of negative perceptions regarding the changes brought about as a result of the computer education being an elective course.

Table 4.16. Descriptive Statistics of the Perceptions of Computer Teachers on the Items Relating to "Current Changes in Computer Education Due to its Being an Elective Course"

Item Statement	Mean	Std. Deviation
Q23. Bilişim Teknolojileri Dersi'nin seçmeli bir ders olması ve not ile değerlendirilmemesi dersin öneminin hâlâ anlaşılmadığının bir göstergesidir.	4.67	0.64
Q24. Öğrenci performansının not ile değerlendirilmemesi öğrencilerin derse karşı olan ilgi ve motivasyonlarını azaltmıştır.	4.61	0.68
Q25. Dersin not ile değerlendirilmemesi, öğrencilerin dersi bilgisayarda oyun oynama ve internete girme aracı olarak görmelerine sebep olmaktadır.	4.65	0.63
Q26. Dersin seçmeli bir ders olması, öğrencilerin ve diğer branş öğretmenlerinin dersi bir eğlence dersi olarak görmelerine sebep olmaktadır.	4.67	0.59

Table 4.16. (Continued)

Item Statement	Mean	Std. Deviation
Q27. Bilişim Teknolojileri Dersi'nin verimliliğinin artırılabilmesi için ders zorunlu ders kapsamına alınmalıdır.	4.68	0.63
Q28. Bilişim Teknolojileri Dersi'nin seçmeli bir ders olması bilgisayar öğretmenlerinin performansını olumsuz yönde etkilemektedir.	4.54	0.72
Q29. Bilişim Teknolojileri Dersi'nin seçmeli bir ders olması öğrencilerin performansını olumsuz yönde etkilemektedir.	4.53	0.71
Sub-scale Overall	4.62	0.55

Based on the responses to the items in the third sub-scale, it is seen that item Q27 (i.e. "Bilişim Teknolojileri Dersi'nin verimliliğinin artırılabilmesi için ders zorunlu ders kapsamına alınmalıdır.") has the highest mean score (M=4.68, SD=0.63), whereas the item Q29 (i.e. "Bilişim Teknolojileri Dersi'nin seçmeli bir ders olması öğrencilerin performansını olumsuz yönde etkilemektedir.") has the lowest mean score (M=4.53, SD=0.71). When standard deviations are investigated, it can be seen that all items have standard deviations lower than 1.00, which indicates that all of the responses to the items were close to the overall mean score for this sub-scale.

Table 4.17. Distributions of Responses on the Items Relating to "Current Changes in Computer Education Due to its being an Elective Course"

Item Statement	SA	A	N	D	SD
	%	%	%	%	%
	F	F	F	F	F
Q23. Bilişim Teknolojileri Dersi'nin seçmeli bir ders olması ve not ile değerlendirilmemesi dersin öneminin hâlâ anlaşılmadığının bir göstergesidir.	73.7	22.0	2.6	1.1	0.6
	258	77	9	4	2
Q24. Öğrenci performansının not ile değerlendirilmemesi öğrencilerin derse karşı olan ilgi ve motivasyonlarını azaltmıştır.	68.3	27.1	2.6	1.1	0.9
	239	95	9	4	3
Q25. Dersin not ile değerlendirilmemesi, öğrencilerin dersi bilgisayarda oyun oynama ve internete girme aracı olarak görmelerine sebep olmaktadır.	71.1	24.9	2.6	0.9	0.6
	249	87	9	3	2
Q26. Dersin seçmeli bir ders olması, öğrencilerin ve diğer branş öğretmenlerinin dersi bir eğlence dersi olarak görmelerine sebep olmaktadır.	71.4	26.0	1.4	0.6	0.6
	250	91	5	2	2
Q27. Bilişim Teknolojileri Dersi'nin verimliliğinin artırılabilmesi için ders zorunlu ders kapsamına alınmalıdır.	74.3	21.7	2.3	1.1	0.6
	260	76	8	4	2
Q28. Bilişim Teknolojileri Dersi'nin seçmeli bir ders olması bilgisayar öğretmenlerinin performansını olumsuz yönde etkilemektedir.	64.3	28.3	5.4	1.4	0.6
	225	99	19	5	2
Q29. Bilişim Teknolojileri Dersi'nin seçmeli bir ders olması öğrencilerin performansını olumsuz yönde etkilemektedir.	62.3	31.4	4.0	1.7	0.6
	218	110	14	6	2

As it is demonstrated in Table 4.16., the responses of the computer teachers to each item on the third sub-scale indicate high levels of negative perception, which is confirmed with high mean scores. As it is illustrated in Table 4.18., the responses to the items reveal an overall agreement of computer teachers on the current changes in computer education due to its elective course status, which is clarified by the overall mean of the sub-scale (M=4.62).

Table 4.18. Agreement Level of Computer Teachers on the Items Relating to "Current Changes in Computer Education Due to its Being an Elective Course"

Item	Agreement (SA+A)		Perception
	F	%	
Q23	335	95.7	The fact that computer education is an elective course is an important indicator that the importance of computer education has not been realized yet.
Q24	334	95.4	Performances of students are not graded in computer education, and this situation decreases the motivation and interest of students.
Q25	336	96.0	Since the performances of students are not graded in computer education, they see computer education as a leisure time to play games and surf the Internet.
Q26	341	97.4	Since computer education is an elective course, students and teachers in other subject areas perceive the course as a leisure time activity.
Q27	336	96.0	In order to increase the efficiency in computer education, it has to be a must course.
Q28	324	92.6	The fact that computer education is an elective course has affected the performance of computer teachers adversely.
Q29	328	93.7	The fact that computer education is an elective course has affected the performance of students adversely.

As a result, according to the responses to the items in the third sub-scale, computer teachers believe that computer education is not perceived as an important subject matter because of its elective course status and the evaluation of students' performances without grading. This situation makes students and other subject matter teachers perceive computer education as a leisure time to play computer games and surf the Internet. In addition, computer teachers believe that computer education must be a must course in order to increase the efficiency of the course, as well as the motivation and interest of the students.

4.4. Perceptions of Computer Teachers Regarding the Status and Duration of Computer Education Course

To investigate what computer teachers think of the duration and the status of computer education course should be in basic education schools, computer teachers were asked to complete a listing table by indicating their perceptions. In this section of the questionnaire, teachers were required to state how they would prepare a new program by determining the length (how many hours a week) and the status (elective vs. compulsory) of the computer education course for each grade level. The results obtained in this part of the questionnaire are demonstrated in Table 4.19.

Table 4.19. Distributions of Responses on the Items Relating to the Status and Duration of Computer Education Course

Grade	Duration of Course					Status of Course	
	None	1 Hour	2 Hour	3 Hour	4 Hour	Compulsory	Elective
1	14.9 %	24.9 %	58.3 %	1.4 %	0.6 %	31.4 %	53.7 %
2	14.9 %	24.9 %	58.3 %	1.4 %	0.6 %	31.4 %	53.7 %
3	14.9 %	24.9 %	58.3 %	1.4 %	0.6 %	31.4 %	53.7 %
4	---	---	82.6 %	12.9 %	4.6 %	97.1 %	2.9 %
5	---	---	82.6 %	12.9 %	4.6 %	97.1 %	2.9 %
6	---	---	63.7 %	22.6 %	13.7 %	97.7 %	2.3 %
7	---	---	63.7 %	22.6 %	13.7 %	97.7 %	2.3 %
8	---	---	63.7 %	22.6 %	13.7 %	97.7 %	2.3 %

Note: Dashes indicate that computer teachers did not state any preferences for these alternatives.

According to the results, it is obviously seen that the perceptions of computer teachers in this respect are quite different from the current situation of computer education. Based on the responses, it can be said that computer teachers have stated their perceptions by dividing the grade levels in three main groups. It is seen that computer teachers have common perceptions for grade levels 1 to 3 (group 1), for grade levels 4 and 5 (group 2), and for grade levels 6 to 8 (group 3).

In terms of the length of computer education, of 350 computer teachers, 52 (14.9 %) stated that computer education should not be a part of the curriculum for grade levels 1 to 3. On the other hand, 298 (85.1 %) computer teachers stated that it should be a part of the curriculum for these grade levels; and the majority of the computer teachers (N=211, 60.3 %) indicate that the length of the computer education course should be at least 2 hours a week for these grade levels.

Regarding the grade levels 4 to 8, almost all of the computer teachers believe that computer education should be a part of the curriculum; and the majority indicated that computer education course should be 2 hours a week for grade levels 4 and 5 (N=289, 82.6 %), and grade levels 6 to 8 (N=223, 63.7 %).

As for the status of the computer education course, for grade levels 1 to 3, of the 298 computer teachers who stated it should be a part of the curriculum for these grades, 188 (53.7 %) stated that computer education should be an elective course. On the other hand, of 350 computer teachers, 340 (97.1 %) stated that computer education should be a compulsory course for grade levels 4 and 5; and 342 (97.7 %) stated that it should be a compulsory course for grade levels 6 to 8.

To discover what kinds of changes computer teachers have observed in students' behaviors and attitudes towards computer education course after the duration of the course had been decreased to one hour a week, an open-ended item was included in the questionnaire. Through this open-ended item in the questionnaire, computer teachers were asked to write their observations about the students in their courses.

Of the 350 computer teachers who participated in this study, 262 (74.9 %) answered the open-ended item by stating their observations about the changes in students' behaviors and attitudes in computer education course after the duration of the course had been decreased. The responses to this question were compiled and analyzed to identify any themes related to the observed changes. Based on the analysis of the responses, an important finding is that the majority of the teachers, 167 in total, associated the observed changes in students' behaviors with the elective status of computer education as well as the decrease in the course hour.

The analysis of responses to the open-ended item revealed one major theme related to the observed changes. According to the responses, it is seen that almost all of the computer teachers, who answered the open-ended item, believed that there was an obvious decrease in the students' motivation and interest in computer education course after the implementation of new regulations requiring the decrease in course hour and the status of computer education as an elective course. Of the 262 participants, 247 (94.3 %) stated this common perceived theme in their responses, and they expressed that students have become so indifferent to the computer education course that most times teachers have nothing to do to attract their attention and motivate them towards the course.

One computer teacher remarked this common perceived theme by stating:

> *"Well, the most noticeable change is that there is a huge decrease in the students' motivation towards this course. I think that computer education is not considered as a course any more by students, but it is seen as a spare time in which students can do their researches for other courses or in which students can have good time playing computer games."*

The views of another computer teacher regarding this situation are as following:

"... I believe that as well as the decrease in the course hour, the status of computer education as an elective course has also affected the students' attitudes and motivation adversely. Students know that computer education is an elective one and computer teachers do not have any sanctions on them. Since they are aware that their performances will not be graded, they do not even fear giving the exam papers without writing anything."

Moreover, most of the computer teachers (N=163) asserted that since computer education course is an elective one, students think that computer education is not an important subject matter and they think that they can do whatever they want. These computer teachers complained that since students consider computer education course as a leisure time activity and since they are not graded in this course, teachers have difficulty in classroom management and it sometimes becomes a big challenge for them to control the students and motivate them towards the course.

For instance, a computer teacher explained his opinions about this issue as the following:

"... I feel so helpless; but unfortunately I do not have any sanctions on students (e.g. grades) in order to make them take my course more seriously. This situation puts me off being a computer teacher. Every time, I try new methods to attract the attention of the students and to teach them something; however, I always find myself as a teacher who is not cared about at all. If this situation continues like that, I think computer education will be a forlorn attempt to achieve the desired outcomes in the information age."

Another computer teacher, who had similar opinions, stated:

"... Students do not do anything I assign to them, and they do not even want to listen to me in the class. Their only aim is to play computer games or online chatting with their friends. This situation creates big problems in terms of classroom management, and as a result, I always have difficulty in keeping the order in the classroom."

Besides these, majority of the computer teachers (N=195) emphasized that as a result of the limited time allocated for computer education, students do not have much time to gain hands-on experience and turn their theoretical knowledge into practice. This situation also affects the motivation and interest of students adversely and decreases the students' desire for learning.

To exemplify, one computer teacher noted this situation by stating:

"Since computer education is only one hour a week, students always complain that they are not able to use computers enough. In my school, each class is crowded and there is not sufficient number of computers in the laboratory. Therefore, two or three students have to share the same computer; and this means that each student is able to use the computer for only ten minutes a week. This situation has decreased the motivation and interest of students. Students think that they do not have much time and they will not be able to learn anything. Therefore, most times, they do not even want to come to the class"

Another computer teacher explained her thoughts as:

"Before the decrease in the course hour, everything was better. If the students had completed their assignments in time, I was awarding them a 10-15 minutes free time to play computer games or surf the Internet. This method was very effective to increase the students' motivation. However, now, it is impossible to do such things in one hour a week. Since time is limited, every minute is very important and I do not have

any chance to waste time. This situation puts students off the computer education course. They always seem indifferent and they do not care about this course any more."

Of the 262 participants, who answered the open-ended item asking what kinds of changes have occurred in students' behaviors after the decrease in the course hour, 15 (5.7 %) stated that they have not observed any changes in students' attitudes towards computer education; however, they are not able to provide students with much time to gain practical experience with computers, which in turn affects the success of students adversely.

One of the computer teachers remarked this perceived theme by stating:

"... With the decrease in the course hours of computer education, I have observed a noticeable decrease in the success of my students. Most of the students do not have a computer at home, and their only chance to use a computer is in this course, which is 40 minutes a week. The settlement of the students on their places and attracting their attention takes 10-15 minutes, and the explanation of the topic takes another 20-25 minutes. So, students have only 10 minutes or so to use computers so that they can turn their theoretical knowledge into practice by applying what they have recently learnt. In such a situation, how can you expect students to become successful and how can you blame them for their failure?"

4.5. The Effect of Demographic Characteristics on Computer Teachers' Perceptions Regarding the Policy of New Computer Education Curriculum and Its Implementations in Schools

In order to investigate if there are significant differences between the computer teachers' demographic characteristics -their gender and the work experience (IVs)- and their perceptions regarding the policy of new computer education

curriculum and its current implementations in schools (DV), inferential statistics (independent-samples t-test and one-way ANOVA) were conducted.

4.5.1. Mean Differences in Computer Teachers' Perceptions Based On Their Gender

4.5.1.1. Recognition and Application of New Computer Education Curriculum

As it is illustrated in the Table 4.20., the independent-samples t-test results indicated that there was not a significant effect of gender on the perceptions of females (M = 34.62, SD = 4.03) and males (M = 34.15, SD = 4.90) regarding the recognition and application of new computer education curriculum [t (348) = .982, p = .33].

4.5.1.2. Current Changes Due to Decrease in Course Hour

As it is illustrated in the Table 4.20., the independent-samples t-test results indicated that there was not a significant effect of gender on the perceptions of females (M = 57.96, SD = 5.62) and males (M = 57.72, SD = 6.84) regarding the current changes in computer education due to the decrease in course hour [t (348) = .350, p = .73].

4.5.1.3. Current Changes Due to Being an Elective Course

As it is illustrated in the Table 4.20., the independent-samples t-test results indicated that there was not a significant effect of gender on the perceptions of females (M = 32.38, SD = 3.94) and males (M = 32.34, SD = 3.81) regarding the current changes in computer education due to its being an elective course [t (348) = .091, p = .93].

Table 4.20. Independent-Samples t-test Results of Gender Effect on the Perceptions of Computer Teachers

	Female		Male		
Perceptions	**M**	**SD**	**M**	**SD**	**t (348)**
Recognition and application of new computer education curriculum	34.62	4.03	34.15	4.90	.982
Current changes in computer education due the decrease in course hour	57.96	5.62	57.72	6.84	.350
Current changes in computer education due its being an elective course	32.38	3.94	32.34	3.81	.091

4.5.2. Mean Differences in Computer Teachers' Perceptions Based On Their Working Experience in Teaching

In order to explore the impact of working experience of computer teachers on their perceptions regarding the policy of new computer education curriculum and its current implementations in schools, a one-way ANOVA was conducted.

4.5.2.1. Recognition and Application of New Computer Education Curriculum

As it is demonstrated in Table 4.21., the ANOVA results indicated that there was not a significant effect of working experience on the perceptions of computer teachers regarding the recognition and application of new computer education curriculum scores, $F(3,346) = 2.703$, $p = .045$. The means and standard deviations for working experience are reported in Table 4.22., and it is seen that there is little difference among groups. Therefore, it might be stated that there is not a

significant difference among the perceptions of computer teachers who have different teaching experiences in computer education.

Table 4.21. Analysis of Variance Results of Working Experience Effect on the Perceptions of Computer Teachers

Perceptions	*df*	*F*	Sig.
Recognition and application of new computer education curriculum	3	2.703**	.045
Current changes in computer education due the decrease in course hour	3	1.359*	.255
Current changes in computer education due its being an elective course	3	.665*	.574

* $p < .05$ ** $p < .001$

4.5.2.2. Current Changes Due to Decrease in Course Hour

As it is demonstrated in Table 4.21., the ANOVA results indicated that there was not a significant effect of working experience on the perceptions of computer teachers regarding the current changes in computer education due to the decrease in course hour, $F(3,346) = 1.359$, $p = .255$. The means and standard deviations for working experience are reported in Table 4.22., and it is seen that there is little difference among groups. Therefore, it might be stated that there is not a significant difference among the perceptions of computer teachers who have different teaching experiences in computer education.

Table 4.22. Means and Standard Deviations of the Participants on the Sub-scales in Accordance With Working Experience

Working Experience	First Sub-Scale[1]		Second Sub-Scale[2]		Third Sub-Scale[3]	
	M	SD	M	SD	M	SD
Between 1 and 3 years	34.80	4.10	57.89	6.45	32.46	4.16
Between 4 and 6 years	33.74	5.04	57.68	5.78	32.09	3.36
Between 7 and 9 years	35.71	4.11	61.86	4.18	34.00	2.65
10 years or more	31.43	3.74	55.43	6.88	32.14	3.58
Overall	**34.40**	**4.46**	**57.85**	**6.22**	**32.36**	**3.87**

Note: 1- Recognition and Application of New Computer Education Curriculum
2- Current Changes in Computer Education Due to the Decrease in Course Hour
3- Current Changes in Computer Education Due to Its Being an Elective Course

4.5.2.3. Current Change Due to Being an Elective Course

As it is demonstrated in Table 4.21., the ANOVA results indicated that there was not a significant effect of working experience on the perceptions of computer teachers regarding the current changes in computer education due to its being an elective course, $F(3,346) = .665$, $p = .574$. The means and standard deviations for working experience are reported in Table 4.22., and it is seen that there is little difference among groups. Therefore, it might be stated that there is not a significant difference among the perceptions of computer teachers who have different teaching experiences in computer education.

4.6. The Analysis of Computer Teachers' Online Forum Messages and News about Computer Education and Their Occupational Problems

As it is aforementioned, in order to explain and refine the results obtained through the items in the questionnaire, qualitative data was collected through the messages posted by computer teachers in online asynchronous discussion forums about the problems they encounter in their profession, and through online and paper news about computer education and the occupational problems of computer teachers.

The analysis of the content of these online forum messages and news assisted in complementing and confirming the results of the quantitative data obtained through the questionnaire, and identifying the certain factors decreasing the effectiveness and efficiency of computer education and the factors adversely affecting the computer teachers' perceptions and attitudes towards their profession and computer education in basic education schools.

As a result of the content analysis of the forum messages and news; three main themes, which revealed the most important factors affecting the effectiveness and efficiency of computer education, were extracted by taking into account the research questions guiding this study. These themes are as the following:

(1) Role conflict of computer teachers

(2) Inadequate technological infrastructure of schools

(3) The status of computer education in school curriculum

4.6.1. Findings from the Analysis of Computer Teachers' Online Forum Messages about Computer Education and Their Occupational Problems

The content analysis of the online asynchronous discussion forum messages revealed that almost half of the messages (N=543, 42.9%) were related to the research problems of the study and contained problem expressions stated by computer teachers. As it is demonstrated in Table 4.23., since more than one type of problem was expressed in some forum messages, a total of 709 problem statements were identified out of 543 messages. These problem expressions were

grouped under the identified three main themes which were extracted based on the factors expressed by computer teachers as affecting the effectiveness and efficiency of computer education in basic education schools.

Table 4.23. Distribution of the Problem Expressions Contained in Forum Messages on the Identified Themes

Themes	F	%
1. The status of computer education in school curriculum	316	44.5
2. Role conflict of computer teachers	262	37.0
3. Inadequate technological infrastructure of schools	131	18.5
Total	**709**	**100**

4.6.1.1. Findings Related to the Status of Computer Education in School Curriculum

As it can be seen in Table 4.23., most of the problems stated by computer teachers in forum messages are mainly related to the status of computer education in school curriculum (F=316, 44.5%). In other words, computer teachers usually stated problem expressions concerning the elective status of computer education course in school curriculum and concerning the limited course time allocated for computer education. Similar to the responses given to the open-ended item in the questionnaire asking the teachers' observations about the changes in students' behaviors and attitudes; in forum messages, computer teachers mainly associated the elective status of computer education and the decrease in the course hour with each other. That is to say, computer teachers expressed these two factors as one

problem statement affecting the effectiveness and efficiency of computer education adversely.

Based on the problem expressions stated by computer teachers, one of the most important findings related to the status of computer education is that the status of computer education affects the attitudes and perceptions of students negatively towards computer education course and computer teachers. As it is stated by computer teachers; since computer education is an elective course and since the duration of the course is considered as insufficient, computer education courses do not attract the attention of students and they usually ignore the course and the computer teachers. This situation affects both the success of the students and the performance of computer teachers adversely.

Following excerpt is an example of this common complaint of computer teachers about the problems they encounter as a result of the elective status of computer education and the insufficient course time:

> *"... I think that students do not take computer education course and teachers seriously. When they come to computer laboratory, their only aim is to play computer games or surf the Internet. It is not important whatever I say, students do not want to listen to me, and they always behave how they want. Since computer education is an elective course, they know that their performances will not be graded, so they think that they can behave freely. I am not happy with this situation; however, there is nothing I can do to change it for the better."*

As it can be understood from this excerpt and from other forum messages, as a result of the elective status of computer education, students usually consider computer education course as a leisure time activity to have fun and they do not want to do the requirements of the course because they are aware that they will not be graded. In forum messages, computer teachers stated that this situation

creates another problem in terms of classroom management and maintaining classroom discipline.

For instance, one computer teacher explained this issue as the following:

> *"... When students come to computer laboratory, they feel as if they were in a very different environment. Sometimes, it becomes impossible to attract their attention and motivate them towards the course. Most students consider the course as a leisure time and their only aim is to play computer games or online chatting with each other. In such an environment, no matter how much I try to have an authority; it is very hard to have control over the students and providing classroom discipline."*

Another computer teacher stated the same issue as the following:

> *"... to speak frankly, students do not care about computer education course at all. They do not want to listen to me and they always want to behave how they like. Although I spend much of the course time to remain classroom discipline and providing silence, it always turns out to be a pointless attempt and they are always very noisy. Since this is an elective course, I do not have a chance to threatening them about their grades. So, I usually punish them by prohibiting using computers, which makes me a bad and hated teacher in the eyes of the students ..."*

Besides these problems, another important problem stated by computer teachers in forum messages is the limited course time allocated for computer education. Almost all of the computer teachers indicated that since course time is not sufficient and since it is an elective course, the computer education is not very efficient and computer teachers always have problems in achieving the desired outcomes of the course. As it is expressed in forum messages, teachers spend

some time getting students ready for the lesson and this situation makes the time limitation of the course worse.

To illustrate, one computer teacher stated that

> *"... I think the duration of computer education course is not enough at all. We have only one hour a week and it becomes really ridiculous when considering the actual instructional time left after making some preparations for the lesson. The settlement of the students on their places takes 10 minutes, attracting their attention and motivating them takes another 10 minutes. So, I have only 10 or 15 minutes to teach the subject. The result is that it is impossible to finish all the activities I have planned beforehand ..."*

Another problem stated by computer teachers as a result of the inadequate course time is the fact that teachers are not able to provide students with much time so that they can gain hands-on practice with computers. Most computer teachers complained that since time is not enough, they have to use such instructional methods as lecturing, which can be completed in relatively short time periods, in order to save time for students. However, as they stated, this is not a good solution and students do not have enough time to gain practical experience with computers.

For example, one computer teacher explained this problem as in the following excerpt:

> *"... the settlement of the students on their places and their logging on to the computers takes 15 or 20 minutes. Then, remaining time is only 15 or 20 minutes. I do not know how I should use time. How can I explain the topic and let my students use computers in such a short time? ..."*

Another important finding of the content analysis of the forum messages is that most of the computer teachers are unable to complete their compulsory working hours because of the decrease in the course hour.

One of the computer teachers criticized this situation as follows:

> *"... since I cannot complete my teaching workload in my own school, I work in two different schools. It is very exhausting for me to run from one school to another. I have to adapt myself to each of them, and sometimes this really tires me a lot ..."*

Apart from these, some computer teachers also asserted that the decrease in the course hour seems as a contraction to the requirements of the information age and the indented goals of computer education to prepare the students for the future and to make them computer and technology literate.

To exemplify, one computer teacher wrote the following complaint about this issue:

> *"... the policy makers say that we are in information age and students should be educated to have necessary skills and knowledge. However, they have limited the computer education to just one hour a week without thinking its consequences. Do you believe that one hour is adequate to learn technology? I think it is definitely not. How can we (computer teachers) prepare our students to adapt themselves to information age in such a limited time?"*

4.6.1.2. Findings Related to the Role Conflict of Computer Teachers

As it can be seen in Table 4.23., the second most frequently mentioned problem, which affects the effectiveness and efficiency of computer education, is the role conflict of computer teachers (F=262, 37.0%). Almost all of the computer

teachers stated that they are expected to perform some duties which are not defined in their actual job description and which are not a part of their actual responsibility of teaching.

The content analysis of the forum messages revealed that as well as their teaching responsibility, computer teachers are generally required to undertake some other responsibilities including repairing and fixing the broken down computers of the school, setting up a network, or designing the web site of the school. Computer teachers asserted that they are usually looked at as a repair-man or a technical service and their actual duty of teaching students how to use computers is overlooked.

As an example, one computer teachers explained this issue as:

> *"... It has been only one month since I started to work, but I feel as if I have been working for ten years. Now, I terribly regret that I became a computer teacher. I am really angry with the people who look at me as a repair-man. As well as the computers at the school, I am also expected to be responsible for repairing the personal computers of the school staff. Quite frankly, I really want to change my profession. We are teachers, not repair-men ..."*

Another computer teacher wrote the following criticism about this issue:

> *"... to speak honestly, we (computer teachers) are considered as the technical laborers of the schools. To be a computer teacher, you do not need to graduate from a university. If you have some technical knowledge about the computers, it is enough. Everyone, who can repair the broken down computers, design a web site or solve the Internet related problems, can be a computer teacher ..."*

Besides, computer teachers also complained that although they are considered as the technical service staff in the school and they are charged with the responsibilities other than teaching, their status seem as unimportant in the school and they do not receive any positive feedback for the extra tasks they perform. Computer teachers asserted that although they expect praise or approval for the things they do, they are usually blamed for the things they cannot achieve.

To exemplify, one computer teacher stated:

> *"... I started teaching with full of enthusiasm and with great happiness. However, although it is my third year in teaching, all my excitement has gone astray. For one reason, I am much overloaded with extra works, but I never get the value I deserve.... I have designed the web site of the school, for which I believe someone from the outside would cost at least $500, but I was even avoided a simple 'thank you' and I was criticized for not updating it regularly.... I am not interested in money; however, I believe that I certainly deserve at least to be appreciated for the works I do ..."*

4.6.1.3. Findings Related to the Inadequate Technological Infrastructure of Schools

As it can be seen in Table 4.23., the third most frequently mentioned problem, which affects the effectiveness and efficiency of computer education, is related to the inadequate technological infrastructure of the schools (F=131, 18.5%).

In the forum messages, computer teachers stated that most of the basic education schools lack the required technological infrastructure for an effective computer education. Computer teachers asserted that in most schools there are not well-equipped computer laboratories, computers are outdated, many of the computers are out of order, some computers lack the essential peripherals like printers,

speakers, CD-ROM drivers or even keyboards and mice, and many schools do not have necessary software for computers.

The following excerpt is a good example of the common complaints of computer teachers about the inadequate infrastructure of the schools, which prevents the effective and efficient computer education in schools:

> *"... in my computer laboratory, there are only thirteen computers, and seven of them have the Windows 3.1 and the other six have Windows 95. Although we are in the 2000s years, we have to use the first versions of the Windows operating system. Most of the keyboards and mice of computers are out of order. I have to teach the subjects (MS Word, MS Excel and etc.) by writing them on the blackboard ..."*

Another computer teacher explained this problem as the following:

> *"... some of the schools have ancient computers and some of the computer teachers have to work with 486DX computers. The system configurations of computers are so out-of-date that it is impossible to install new and current software on these computers ..."*

Computer teachers also stated that when the lack of required technological infrastructure of schools merges with the elective status of computer education and the limited course time, it becomes unavoidable to experience bigger problems and the result is a completely ineffective computer education.

For example, one computer teacher stated that:

> *"... since I am not able to complete my teaching workload, I have to work in two different schools, one of which does not have a computer laboratory. There is not a computer laboratory, and I am trying to teach computers to the students, most of whom have never seen a computer*

before or most of whom do not have any chance to use computers outside of school. In the other school, the computers are so out-dated that booting them up takes 15 minutes. So, I spend half of the course hour starting the computers and restoring the classroom discipline. How can you expect the computer education to be effective in such a situation?"

Besides these, another problem computer teachers have to face as a result of the inadequate technological infrastructure of the schools is the fact that in most schools, especially in the state schools, there are relatively overcrowded classes; however, there is not adequate number of computers for students' use. As a result of this situation, two or three students have to share the same computer, which decreases the computer usage time for each student.

Concerning this issue, one computer teacher wrote the following:

"... I work in a school where there are approximately 50-60 students in each class. However, there are only fifteen computers in my computer laboratory. What is worse, all of them are out-of-date and it sometimes becomes impossible to run the simplest software such as office programs on these computers. And, the worst is that three or four students have to share one computer. I spend every day in torment trying to teaching something in these conditions ..."

4.6.2. Findings from the Analysis of the News about Computer Education and Occupational Problems of Computer Teachers

The content analysis of the news concerning the computer education and the occupational problems of computer teachers revealed that almost all of the news (N=19, 90.5%) were related to the research problems of the study and contain data complementing and confirming the results of the quantitative data obtained

through the questionnaire and the results obtained through the content analysis of online forum messages.

As it is demonstrated in Table 4.24., since more than one type of problem was expressed in some news, a total of 32 problem statements were identified out of 21 pieces of news. Since the content analysis of the news revealed that news and the forum messages have similar contents, these problem expressions were grouped under the identified three main themes which were extracted based on the factors expressed by computer teachers in online forum messages as affecting the effectiveness and efficiency of computer education in basic education schools.

Table 4.24. Distribution of the Problem Expressions Contained in the News on the Identified Themes

Themes	F	%
1. The status of computer education in school curriculum	19	59.4
2. Role conflict of computer teachers	5	15.6
3. Inadequate technological infrastructure of schools	8	25.0
Total	**32**	**100**

In parallel with the findings obtained through the content analysis of the online asynchronous discussion forum messages, the most frequently mentioned problem is the elective status of computer education in the curriculum and the time limitation of the course. In almost of all the news, it is stated that since computer education is an elective course, students, as well as their parents, tend to think that

computer education is not as important as the other courses, and this situation has decreased the interest and motivation of students in computer education course.

To exemplify, in one of the news, this situation is emphasized as in the following way:

> *"... unfortunately, computer education is not graded. Since there is not an effective guiding system in the schools, students are always inclined to think that grade is more important than anything else. Students do not have to worry about their grades in computer education, so they do not take the course and the teacher seriously. Students always consider computer education as a means of pastime to play games ..."*

Moreover, in almost of all the news, it is criticized that the course time allocated for computer education is not enough, and time limitation of the course influences the effectiveness of computer education adversely.

For example, in one of the news, this matter is explained as in the following:

> *"... Just one hour a week for computer education is not adequate at all. It is not enough time to do anything in the class. When considering the fact that teachers spend some time (10-15 minutes) for the settlement of the students, starting the computers, and restoring the classroom discipline, it seems impossible to have an effective computer education in the remaining 20-25 minutes ..."*

As it can be seen in Table 4.24., the second most frequently mentioned problem in the news, which affects the effectiveness and efficiency of computer education, is related to the inadequate technological infrastructure of the schools (F=8, 25.0%). Similar to the findings of the content analysis of the forum messages, in the news, it is stated that some schools do not have a well-equipped computer laboratory and other required technological facilities for computer education. When the

inadequate technological infrastructure of the schools is combined with the other drawbacks including the elective status of computer education, limited course time, and the overcrowded classes in the schools, the result is an unavoidable ineffective computer education.

The following news excerpt is a good example for the criticism of this matter:

> *"... in some schools, the technological infrastructure is not good enough, and the worse thing is that there are approximately 40-50 students in each classroom, which means that one computer is shared by two or three students. Moreover, the course time for computer education is very limited; therefore, students do not have much time to use computers ..."*

Finally, the last problem mentioned in the news is related to the role conflict of computer teachers. As in the online forum messages, in some news (F=5, 15.6%), it is asserted that computer teachers are required to undertake some responsibilities in the school other than their actual responsibility of teaching, and this situation is a negative factor which decreases the effectiveness and efficiency of computer education.

The following news excerpt provides a summarization of this matter:

> *"... computer teachers are expected to perform such duties as repairing the broken-down computers of the school or designing its web site, and their actual responsibility of teaching is disregarded. As a result, they could not focus on their lessons, and their inclination for teaching decreases day by day ..."*

The findings from the analysis of the online asynchronous forum messages and the news about computer education and the occupational problems of computer teachers could be summarized as in the Table 4.25.

Table 4.25. Summary of the Findings from the Analysis of Online Forum Messages and News about Computer Education

	Theme	F	Example Quotations
Findings from the analysis of online forum messages	The status of computer education in school curriculum	316	… students do not take computer education course and teachers seriously … … sometimes, it becomes impossible to attract their attention and motivate them towards the course. Most students consider the course as a leisure time and their only aim is to play computer games or online chatting with each other … … We have only one hour a week and it becomes really ridiculous when considering the actual instructional time left after making some preparations for the lesson …
	Role conflict of computer teachers	262	… I terribly regret that I became a computer teacher. I am really angry with the people who look at me as a repair-man … … To be a computer teacher, you do not need to graduate from a university. Everyone, who can repair the broken down computers, design a web site or solve the Internet related problems, can be a computer teacher … … although it is my third year in teaching, all my excitement has gone astray…. I am much overloaded with extra works, but I never get the value I deserve …
	Inadequate technological infrastructure of schools	131	… There is not a computer laboratory, and I am trying to teach computers to the students, most of whom have never seen a computer before or most of whom do not have any chance to use computers outside of school …

Table 4.25. (Continued)

	Theme	F	Example Quotations
	Inadequate technological infrastructure of schools	131	… there are approximately 50-60 students in each class. However, there are only fifteen computers in my computer laboratory and three or four students have to share one computer ... … I have to teach the subjects (MS Word, MS Excel and etc.) by writing them on the blackboard …
Findings from the analysis of the news	The status of computer education in school curriculum	19	… Students do not have to worry about their grades in computer education, so they do not take the course and the teacher seriously … … Just one hour a week for computer education is not adequate at all. It is not enough time to do anything in the class …
	Inadequate technological infrastructure of schools	8	… in some schools, the technological infrastructure is not good enough, and the worse thing is that there are approximately 40-50 students in each classroom, which means that one computer is shared by two or three students ...
	Role conflict of computer teachers	5	… computer teachers are expected to perform such duties as repairing the broken-down computers of the school or designing its web site, and their actual responsibility of teaching is disregarded …

CHAPTER 5

CONCLUSION AND DISCUSSION

5.1. Introduction

As it is aforementioned, the purpose of this study was to investigate the current status of computer education in Turkish basic education schools by exploring the perceptions of computer teachers in terms of the policy of new computer education curriculum, which was prepared in 2006, and its actual implementations in schools. The primary focus of the study was to develop a deeper understanding about the effects of new computer education curriculum on the basic education school computer teachers and students, their perceptions about the effectiveness of the new curriculum, and the main barriers and enablers in computer education by comparing the policy of computer education with the existing school practice.

In the light of the purpose stated above, this study focused on the following research problems:

(1) To what extend do the current perspectives and instructional practices of the computer teachers working in basic education schools accord with the new computer education curriculum?

1.1. How does the existing school practice of computer education in basic education schools differ from the policy stipulations?

(2) How did the change in the hour of the computer education course affect the teaching and learning activities computer teachers use in their instruction?

(3) What are the perceptions of the computer teachers regarding the new computer education curriculum?

3.1. What are the perceptions of the computer teachers regarding the recognition and application of new computer education curriculum in basic education schools?

3.2. What are the perceptions of the computer teachers regarding the changes that have occurred in computer education since the duration of the course hour was decreased to one hour a week at all grade levels in basic education schools?

3.3. What are the perceptions of the computer teachers regarding the changes that have occurred in computer education since it was declared as an elective course at all grade levels in basic education schools?

(4) How is new computer education curriculum recognized by the computer teachers?

(5) Are there any differences among computer teachers' perceptions regarding the new computer education curriculum based on their gender?

5.1. Are there any differences among computer teachers' perceptions regarding the recognition and application of new computer education curriculum based on their gender?

5.2. Are there any differences among computer teachers' perceptions regarding the current changes in computer education due to the decrease in the course hour based on their gender?

5.3. Are there any differences among computer teachers' perceptions regarding the current changes in computer education due to its elective course status based on their gender?

(6) What problems and concerns are stated by the computer teachers in online asynchronous discussion forums pertaining to the new computer education curriculum?

(7) What problems and concerns are expressed in online and paper news pertaining to the new computer education curriculum?

In this chapter, firstly; the major findings and the discussions about the current status of computer education in basic education schools are presented based on the related literature. Then, it continues with the implications for practice and further research.

5.2. Conclusions and Discussions

5.2.1. Major Findings and Discussions about the Integration of Computer Education into Turkish Basic Education Schools

At the beginning of the twenty-first century, Turkey has realized that it was crucial to educate individuals who are equipped with the required knowledge and skills to survive in the information age. One of the possible alternatives to keep pace with the information age and to improve education in this way was to integrate ICT into Turkish Educational System all at levels (Göktaş, 2006).

As one of the main measures to integrate ICT into education, the Turkish MoNE has initiated a two-phased comprehensive educational investment project called "Basic Education Program" (BEP), which was financed by the World Bank, with an intention to improve the quality of education by making each student and teacher at least computer literate and efficient in using information technologies (Akbaba-Altun, 2006). In addition to BEP, the MoNE has designed and implemented various activities in its efforts to improve the quality of education through introducing computer literacy and training into basic education school curriculum.

It is obvious that Turkey has made a large financial investment to integrate information technologies, especially the computer technologies, into education in order to improve the quality of education by means of educating individuals corresponding with the requirements of the information age. However, as the results of the current study demonstrate, while the MoNE was conducting a series of actions to introduce computer technologies into education, it has overlooked the fact that making some political decisions is not enough to improve the quality of education in general, and of the computer education in particular, without considering the actual implementations of policies in schools.

Integration of computer technologies into a centralized educational system such as Turkey's is not as easy, and it depends on a successful design and application, which is an expensive and complex process (Akbaba-Altun, 2006). Based on the results of the study, it is seen that the outcomes of activities carried out to integrate computer technologies into education and to improve the quality of computer education in schools are unsatisfactory. It is clear that the effective use of computers in education depends not only on financial resources but also other interlinking variables one of which is the good and systematic planning to integrate computers into the curriculum. While Turkey was making investments to improve the quality of computer education in schools, it has not taken into account the main barriers, which might be faced during actual implementations of the educational policies in schools, and therefore; it has failed to provide an effective and efficient computer education.

While making investments to integrate computers into education, it should be taken into consideration that "while it would be difficult to deny the value - even the necessity - of bringing technology into schools, evidence from the past decade provides strong evidence that misguided policies and funding ICT in education may fail to have the desired education outcomes, while costing more than other education interventions" (Wagner, et. al, 2005, p.1). The results of the present study show that although the MoNE has made a considerable effort to integrate computer technology into the school curriculum, it has neglected the actual needs

of the students as well as the computer teachers, and it has overlooked the fact that the success of initiatives in computer education is highly dependent on the actual implementation of the policies in schools.

The availability of computer equipment does not ensure that computer technology will be integrated effectively into education. There are many factors that should be taken into consideration before making any investments for technology integration. According to Barnett (2001), computer technology integration is not about hardware, internet connections, or other similar factors. Barnett (2001) and Patricas & Newton (1999) point out that one of the most important factors to ensure that investments in computer technology have a positive impact on students and teachers, a thoughtful technology plan should be prepared.

Upon realizing the fact that in spite of the large financial investments in computer technology, the outcomes of the actual implementations in schools were not satisfactory; the MoNE has decided to take a series of actions to change the situation for the better. As one of the taken measures, with an intention to provide a well-planned and implemented computer education to the students in basic education schools throughout the whole country, the MoNE developed a new computer education curriculum in 2006.

As Akbaba-Altun (2006) states curriculum plays a crucial role both at the development and implementation levels of computer education in schools. Although the MoNE has indented to improve the quality of computer education in schools by developing a new curriculum, the implementations of new curriculum has appeared to generate new problems in addition to the existing ones. With the introduction of the new computer education curriculum in basic education schools in 2006, MoNE has decreased the length of computer education course in schools from two hours a week to one hour a week. In addition, computer teachers have been required to evaluate students' performance without grading. As it is confirmed by the findings of this study, as a result of these changes in the new

curriculum, computer teachers have faced many problems to overcome, some of which can be listed as follow:

(1) Because of the elective status of computer education course, computer teachers are required to assess students' performance without grading. As a result of this situation, students' attitudes toward computer education have changed adversely and they began to think that computer education is not as important as the other compulsory courses like mathematics or science education.

(2) Students' motivation toward and interest in computer education have been decreased. Many times, students do not take computer education course and computer teachers seriously, which results in the dissatisfaction and the anxiety on the part of the computer teachers.

(3) Because of the limited time allocated to computer education course (one hour a week), working hours of computer teachers have been halved, and they are required to involve in more technical works in schools in their remaining time. Consequently, computer teachers are made use of the technical staff of the schools, which results in the role conflict in the computer teachers.

(4) Since the teaching workload of the computer teachers in computer education have decreased, computer teachers are required to teach in other courses which are not their own discipline. In addition, if it is impossible for computer teachers to complete their compulsory teaching workload in their own schools, most of the time, they are employed in more than one school in order to complete their compulsory teaching workload.

(5) Although computer education is a practice-based course, students are not able practice enough what they have learned because of the limited time period allocated to computer education. So, their learning in computer education is limited to the theoretical knowledge which can

be easily forgotten without making enough hands-on practice on computers.

(6) In addition to the elective course status of the computer education and the limited course time, which decrease the effectiveness and efficiency of computer education, the lack of the required technological infrastructure of the most schools makes this situation worse for both the computer teachers and the students.

Considering this situation, it seems vital to pose the question of whether or not the MoNE has reached to its aim of making computer education more effective by developing a new computer education curriculum. In other words, whether or not the designed policy in computer education has a parallelism with its actual implementation in schools is not clear.

5.2.2. Major Findings and Discussions about Computer Teachers and Their Working Conditions

Results of the current study indicated that the majority of the computer teachers who participated in this study have teaching experience between one and six years, and only a small portion of them have teaching experience more than seven years. This can be understood from the fact that the departments which educate computer teachers have relatively a short history in Turkey; and the graduates of these departments have been performing computer teachers in the past six or seven years since 2002 (Çakır, 2008). Computer teachers who have teaching experience more than seven years could be the ones who have graduated from other disciplines and become computer teachers later on. However, the more interesting situation is that, in developed countries there are not such departments in universities to educate computer teachers; and since ICT is usually implemented as a tool for learning and teaching across the whole school curriculum rather than as a separate subject matter, all teachers are required to master some basic skills in the use of computer technology (Law & Plomp, 2003).

Based on the results of the study, it is seen that the majority of the computer teachers who participated in this study like being a computer teacher. Koca and Şen (2006) emphasized the importance of liking the teaching profession and they stated that liking is an important factor in being a good teacher. However, it is noteworthy that although they like being a computer teacher and take pleasure in teaching, they have some negative opinions about their profession because they consider that working conditions of computer teaching are not very appealing and these adverse conditions put them off being a computer teacher.

According the results of the present study, computer teachers believe that computer teaching profession is not respected by both the teachers from other disciplines and the students. Both in the responses given the questionnaire items and in the online discussion forum messages, computer teachers express that their actual responsibility of teaching is usually overlooked and they are perceived as the technical staff of the schools. They stated that they are required to perform some tasks that could be considered as unrelated to their actual job description. These kinds of expectations from computer teachers to perform other tasks cause computer teachers to experience role conflict in their profession.

Role conflict occurs when one demand placed on an individual conflicts with one or more other demands placed on him or her (Brewer & Shapard, 2004). In many studies, it has been found that role conflict is a major source of job-related stress and it has been linked to the burnout in teaching profession (Brewer & Shapard, 2004; Friedman, 1991; Kyriacou, 2001; Schwab & Iwanicki, 1982; Schwab, Jackson, Schuler, 1986). Analyzing the data of the research, it is obviously seen that although the majority of the computer teachers who participated in this study like their profession, because of the additional duties they are expected to perform, they experience a role conflict in their workplace, which in turn could result in high levels of burnout in computer teachers in time.

The term burnout can be defined as the inability to function effectively in one's job as a result of the prolonged and extensive job-related stress (Freudenberger,

1974, as cited in Deryakulu, 2006). Since computer teachers experience high levels of stress due to the role conflict they have to face in their work environment, it is unavoidable for them to experience burnout. According to the results of this study, computer teachers reported that in addition to the time they spend for their teaching responsibility, because of the extra demands made upon them, they have to spend extra time in the school to meet these demands. This situation leads to the feeling of work overload in computer teachers, which is another factor developing burnout in teachers.

In a study conducted by Freudenberger (1974, as cited in Friedman, 1991) on the teacher stress and burnout, it is stated that when teachers experience burnout, they have the feelings of failure as a result of the overload of claims on their energy. Similarly, Kyriacou (2001) emphasizes that when the demands placed on teachers exceeds their ability to cope with those demands, it is unavoidable for them to experience the feelings of failure. Based on the results of the present study, it is seen that computer teachers are not satisfied with their profession because they perceive themselves as overloaded with the extra duties they are expected to perform, and they sometimes feel themselves unsuccessful in coping with their profession. The job dissatisfaction of computer teachers results in a decrease in their teaching performance, which in turn affects adversely the effectiveness and the efficiency of computer education in schools.

Besides these, the results of this study also reveal that although computer teachers are expected to perform the extra duties which are unrelated to their actual job description, they do not receive any praise and approval for these extra demands from the school administration or from their colleagues. The lack of positive feedback for their extra efforts, as it is emphasized in another study conducted by Pines (2002), leads computer teachers to believe that their work is not important enough to justify someone else's attention, and computer teachers feel that they are alone in trying to do their work. Furthermore, since computer teachers spend most of their time in the school satisfying the extra demands instead of their actual

responsibility of teaching, they feel that computer teaching is not valued and cared about by both the school staff and the students and their parents.

In the present study, the results also show that in addition to the role conflict computer teachers experience, some other factors also affect their attitudes to and interest in their profession. For example, the indifference and inattentiveness of the students towards computer education course, relatively overcrowded classrooms in the schools, the lack of required technological infrastructure, insufficient teaching time, and the optional status of computer education course are the some of the main factors that prevent computer teachers from performing their job effectively and that decrease the effectiveness of computer education in schools. As a result of these kinds of discouraging factors, computer teachers also expressed that their excitement and interest in their profession decreases day by day. According the results of this study, although most computer teachers chose computer teaching at their own will, their positive perceptions towards computer teaching profession have changed over the years, and they are not as curious and enthusiastic about teaching as they first began their profession.

Based on the expressions of the computer teachers, it can be concluded that the negative perceptions of computer teachers apparently affects their performance in teaching adversely, which in turn decreases the effectiveness and efficiency of computer education courses in schools. In the related literature conducted about the professional growth of teachers, it is demonstrated that positive thinking towards the profession is one of the main characteristics of effective and good teaching (Fajet, Bello, Leftwitch, Mesler, Shaver, 2005; Minor, Onwuegbuzie, Witcher, James, 2002; Witcher, Onwuegbuzie, 1999). Similarly, Çakır (2008) stated that when the perceptions of teachers towards their profession are high, their performance in teaching accordingly becomes high. Furthermore, Fajet et al. (2005) emphasized the importance of the link between the enthusiasm and eagerness about the profession and the quality of good teaching. However, the results of the current study show that computer teachers have lost their excitement toward their profession because of the aforementioned negative factors, which

results in the decrease in the quality of their teaching performance and the quality of computer education in schools.

5.2.3. Major Findings and Discussions about the Current Situation of Computer Education in Turkish Basic Education Schools

Based on the results of the present study, it is possible to say that there is a relatively big gap between the policy of computer education and the actual implementations of computer education course in basic education schools. As it is aforementioned, the MoNE has aimed to improve the quality of education through introducing computer literacy and training into basic education curriculum. With this purpose, MoNE has included computer literacy and education in primary education curriculum, and established and equipped learning centers named "Information Technology (IT) Classes" in almost all primary schools throughout the whole country (MoNE, 2003a, 2006a; World Bank, 2002). However, the analysis of the data of the current research clearly shows that the current situation of computer education is far more different than the planned policy.

As it is aforementioned, the MoNE introduced computer education in basic education schools in 1998-1999 school year. In these early years, computer education was implemented only in schools which had an established computer lab ready to use. As well, in these early years, computer education was provided for the students at the grade level from 4 to 8 as an elective course, which was 1 or 2 hour a week depending on the grade level of the students. These early policies and strategies of the MoNE to introduce computer education in schools were implemented in schools until the 2006-2007 school year. Parallel to the new advancements in computer technology and developments in information and communication technologies, MoNE has realized that it should review and revise the strategies and polices on computer education; and in 2006, the MoNE developed new policies on computer education in basic education schools and designed a new computer education curriculum.

The MoNE has developed the new computer education curriculum with an intention to improve computer education. However, because of the some regulations made in this new program, many problems have been faced during the actual implementations of the newly prepared curriculum in basic education schools.

One of the most important problems faced during the implementation of computer education in schools is the elective status of computer education course. According to the Regulation (No.111) of TTKB (2007), elective courses stated in basic education curriculum are not evaluated with grades. The results of the study demonstrated that computer education is not perceived as an important subject matter because computer education is an elective course and because performances of students are not evaluated with grades. Based on the computer teachers' views, neither students nor other subject matter teachers perceive computer education as a necessary course, and they consider that computer education is a leisure time activity to play computer games or surf the Internet. Moreover, analyzing the data of the research, it is worth noting that since students consider computer education course as a leisure time activity and since they are not graded in this course, they believe that they can do whatever they want in the classroom. As a result of this situation, computer teachers have to face the problems in terms of classroom management and it sometimes becomes a big challenge for them to have control over the students and motivate them towards the course. According to the responses of computer teachers, regarding these problems related to the elective status of computer education, it is possible to say that computer education must be a compulsory course in order to increase the efficiency of the course, as well as the motivation and interest of students.

Similarly, previous studies in the literature show that the elective status of computer education is a big obstacle to the effectiveness and efficiency of the course. For example, in a study conducted by Deryakulu and Olkun (2007), in which online discussion messages of computer teachers about their job satisfaction were analyzed, it is emphasized that because the computer education

course is elective, the majority of the students consider this subject as unimportant. Moreover, Seferoğlu (2007) argues that many problems have emerged as a result of the fact that computer education is an elective course and the students are not graded in this course. Similarly, according to Deryakulu (2006), students are often disinterested and unmotivated in computer education courses; and they regard the computer classes as a means of pastime to play computer games or surfing the Internet.

According to the findings of the study, another important problem in the computer education is the limited course time. Based on the responses of computer teachers, it is obvious that the limited course time allocated for computer education results in many problems both for the computer teachers and the students in the applications. For example, one of the most important problems is that the limited course time negatively affects the attitudes of students towards computer education and computer teachers. When the fact that computer education is one hour a week merges with the fact that computer education is an elective course, students tend to think that computer education is not as important as the other courses; and this situation negatively affects the success of the course. Similarly; Hendley, Stables and Stables (1996) emphasized that subjects which occupy little time in the curriculum are perceived by students as being of low status, and there is a relative lack of enthusiasm for these subjects. Regarding this situation, it is possible to say that increasing the course time of computer education may improve the perceptions of students towards this course and may make them aware of the importance of computer education.

Furthermore, the results of the present study indicated that since the duration of computer education is insufficient, students do not have much time to gain enough hands-on experience and turn their theoretical knowledge into practice. Inevitably, this situation negatively affects the motivation and interest of students, and decreases the students' desire for learning. These results are supported by previous studies in the literature. For example, in a study conducted by Çakır (2008), it is concluded that duration of computer education is very limited and it is

not enough to fulfill the all requirements of the course. Likewise, Deryakulu (2006) asserted that due to the time limitation of the computer course, most computer teachers are not able to provide enough computer practice for each student. Therefore, it seems vital to increase the total teaching time in computer education in order to provide students with enough hands-on experience to strengthen their learning.

Besides these, the time limitation of computer education also restricts the teaching and learning methods that computer teachers employ in their instruction. Analyzing the data of the research, it is noteworthy that the length of the computer education course is an important determinant for the selection of the teaching and learning methods used in instruction. Results of the present study clearly show that with the decrease in the course hour of computer education, computer teachers began to use instructional methods which could be completed in a relatively short time periods. Moreover, the findings of the study show that there is another important factor which prevents computer teachers from using instructional methods taking longer times. Based on the views of computer teachers, it is possible to say that the nature of computer education course is quite different from the other courses. According to the computer teachers, motivating students and attracting their attention is very difficult in a computer laboratory because in such an environment the only aim of the students is to use computers and they may ignore the presence of a teacher. As a result, getting students ready for the lesson takes some time, which also limits the instructional time of computer teachers. Similarly, a study conducted by Timuçin et al. (2007) indicates that computer teachers have changed the way they teach because of the time limitation of the course and they prefer to use such instructional methods as lecturing which take relatively little time. In the same study, it is also emphasized that computer teacher have abandoned the such methods as project-based learning and brain-storming which could be completed in longer time periods.

Apart from these, the results of the current study indicated that the time limitation of the course results in another problem in terms of the workload of computer

teachers. According to the law of the MoNE (2006b) concerning the workloads of teachers (Law No: 1/12/2006-2006/11350), a computer teacher has to work at least 15 hours a week. However, the findings show that almost more than half of the computer teachers are not able to complete their compulsory workload in computer teaching. As a result of this situation, they are obligated to teach in courses other than computer education by school administration in order to complete their compulsory workload in teaching. These findings coincide with the findings of the previous studies in the literature. For example, in their research, Timuçin et al. (2007) state that computer teachers are required to teach in other courses because most of the time their workload in computer teaching is less than 15 hours a week. Furthermore, if it is impossible for computer teachers to complete their compulsory teaching workload in their own schools, they may be employed in more than one school.

Based on the results of the study, another important problem faced during the implementation of computer education is the insufficient technological infrastructure of the schools and insufficient technical support. The results show that most schools lack the required technological infrastructure for an effective and efficient computer education. According to the responses of computer teachers, in most schools there are not well-equipped computer laboratories, computers are outdated, many of the computers are out of order, some computers lack the essential peripherals like printers, speakers, CD-ROM drivers or even keyboards and mice, and many schools do not have necessary software for computers. In their research, Deryakulu and Olkun (2007) state that without well-equipped computer laboratories and required technical support, it is impossible for computer teachers to continue their classes effectively and properly.

These results are generally supported by the findings of previous studies in the literature. For example, in their study about the successful implementations of instructional technologies; Granger, Morbey, Lotherington, Owston and Wideman (2002) argue that the lack of appropriate material resources required for a course inhibits learning and causes frustration and resistance both in students and in

teachers. Similarly, Ertmer (1999) emphasized that even if there are favorable conditions in a learning environment, the lack of required hardware and software constitutes a major obstacle for effective learning and teaching.

Moreover, Deryakulu and Olkun (2007) concluded that when the lack of required technological infrastructure of schools and the technical support merges with the elective status of computer education and the limited teaching time, ineffective computer education seems unavoidable. Therefore, for an effective and efficient computer education in schools, technological infrastructure of the schools should be improved, and continuous technological renovation and technical support should be provided.

Along with the negative factors that prevent an effective computer education in schools, the results of the study also reveals that the new computer education curriculum has some positive aspects when it is compared with the old curriculum. This finding of the present study is also confirmed by the results of another study conducted by Seferoğlu (2007) in order to define the problems faced during the implementation of the new computer education curriculum. In his research, Seferoğlu (2007) indicates that despite the problems encountered in its implementation in schools, new curriculum has many advantages in terms of its objectives, performance indicators, project-based activities, sample activities and evaluation modules.

Furthermore, based on the results of the current study, it can be concluded that the new curriculum provides flexibility for computer teachers in their instruction in terms of the content of the instruction. In the old computer education curriculum, which was implemented from 1998 to 2006, the needs of the students were not considered and analyzed thoroughly, and the content for 4th, 5th, 6th, 7th, and 8th grades was almost identical. Since computer teachers had to keep up with the official curriculum, and the framework and the objectives were the same for 4th graders and 8th graders; they were repeating the same thing every year with the same students (Akbaba-Altun, 2006). However, with the new computer education

curriculum, the content has been changed and a new approach was brought to computer education. The content of the new curriculum is made up of eight progressive levels, which outline the goals and objectives definitely for each level, rather than constant and same learning objectives for each grade level. Computer teachers can choose a level from one to eight to teach depending on the background knowledge and skills of their students in computer education without considering the grade level of them.

5.3. Implications for Practice

Based on the findings of the study and discussions, the following implications and recommendations are suggested for practice:

(1) By means of this study, it is aimed to reveal the current situation of computer education in basic education schools through describing how computer teachers feel about the changes made with the introduction of the new computer education curriculum and how this situation has affected their professional life. In other words, the present study describes what is going on in the context of computer education courses in schools, how computer teachers and students perceive the new curriculum, which problems they have to overcome, and what they think should be done in order to change the existing situation for the better. In this way, this study could provide a guideline for the policy makers to make some changes in order to make computer education more effective by taking into consideration the ideas of the actual implementers (teachers and students) of the policies in schools. Putting it differently; the results of this study can be used by the legislators, politicians, policy makers and the Ministry of National Education for review the current status of computer education and revise the related policies and strategies to improve the existing situation of computer education in basic education schools.

(2) The results of this study demonstrate that the time allocated for computer education course is not enough to cover all the subjects in the curriculum and to provide enough hands-on experience for each student. Furthermore, according to the results, it is possible to say that limited course time causes students to perceive computer education as low status compared to other courses. Therefore, the total course time allocated for computer education should be increased both to provide computer teachers with enough time to cover all the subjects in the curriculum and to provide students with enough hands-on practice with computers. In addition, increasing the weekly course time could help to improve the perceptions of students regarding the importance of computer education.

(3) Additionally, the results show that due to the decrease in the course hour, majority of computer teachers are unable to complete their compulsory working hours in one school. Consequently, most computer teachers are required to work in more than one school, and sometimes the level and types of these schools are different from each other. As a result, computer teachers work hard to adapt themselves to different schools, and they need to make adjustments for particular needs of those schools. This situation reduces the commitment of computer teachers to a particular school. To solve this problem, new regulations should be made to employ each computer teacher only in one school. In this way, a sense of belongingness to a particular school can be developed in computer teachers, and their teaching performance can be increased.

(4) Another noteworthy finding of this study is that the elective status of computer education course is a restrictive factor decreasing the effectiveness and efficiency of computer education. Since computer education is an elective course and since students are not graded in this course, most students tend to think that computer education is not as important as the other compulsory courses. This situation increases the inattentiveness and indifferences of students and decreases their

motivation towards computer education. In addition, this situation also negatively affects the effectiveness of computer teachers in teaching. Therefore, computer education should be a compulsory course to make the students realize the importance of this subject and to increase their motivation.

(5) In addition, in national high school entry exams like SBS (Seviye Belirleme Sınavı), questions should be included related to the information and communication technology subject areas. In this way, students' interest and motivation can be increased in computer education course and they can be made realize the importance of this field.

(6) The present study also reveals that the most schools lack the required technological infrastructure and technical support for an effective computer education. Since most schools do not have well-equipped computer laboratories, it becomes impossible for computer teachers to continue their classes properly. As Deryakulu (2006) emphasized loading laboratories with computers is not enough for an effective and efficient computer education; therefore, the most important point in computer education is providing upgraded computers with upgraded operating systems and software, in addition to the technical support provided for teachers when needed. As a result, for an effective and efficient computer education in schools, technological infrastructure of the schools should be renovated continuously, and technical support services should be provided when needed.

(7) The job descriptions of computer teachers should be reconsidered. In most public schools, computer teachers are expected to perform extra demands that seem to be unrelated to their actual job description; which results in role conflict in computer teachers. Due to inadequate technical facilities and support services, computer teachers are required to undertake related responsibilities and perform some extra jobs such as repairing the broken down computers in addition to their routine

teaching responsibilities. This additional workload makes computer teachers feel tired and affects negatively the teaching performance of computer teachers. Therefore, the roles and responsibilities of computer teachers should be clearly described to prevent role conflict.

5.4. Implications for Further Research

In addition to the implications and suggestions for practices, the following recommendations may be used as a guide for further research studies:

(1) There are not many research studies that examine the integration of computer education into the educational system in Turkey and in the European countries. Therefore, this study is expected to contribute to the literature by filling this important gap concerning the computer education in schools. The current study will provide valuable information regarding the current situation of computer education in basic education schools and the differences between the policy of computer education and its actual implementations in schools in Turkey. In addition, the findings of the present study will hopefully shed light for future research studies on similar subjects in this area.

(2) In this study, the perceptions of computer teachers were investigated in order to examine the current situation of computer education in basic education schools. However, more studies should be done in order to make the computer education more effective and efficient in schools. Therefore; with respect to the current study, similar studies should be conducted to investigate the perceptions of the policy makers of the MoNE, school administration staff, and the students regarding the policy of computer education and its real life implementations in schools. In this way, the empirical and the theoretical foundations of this study can be strengthened.

(3) In this study, convenience sampling methodology was utilized for the selection of computer teachers. Therefore, it can be stated that the results of this study are limited only as to the participants. Regarding this issue, new research studies should be conducted using more extensive sampling methods like random sampling methodology. In addition, in this study, the intended number of samples was not accessed because of the unwillingness of computer teachers to take a part in the study; which limits the generalizability of the results. Therefore, in future research studies, more individuals should be included in the data collection process in order to get more reliable and valid results and to increase the generalizability of the study.

(4) In order to investigate the current situation of computer education in more depth, future research studies should use more qualitative research methodologies such as interviews and observations.

(5) According to the results of this study, it can be concluded that computer teachers are not satisfied with their profession and they have lost their interest in computer teaching over the years. In addition, some negative factors such as inattentive and indifferent students, poor working conditions, and role conflict seem to result in burnout in computer teachers. However, because the current study was not designed to specifically examine the reasons for burnout in computer teachers and its effects on computer education, further research should be conducted in order to investigate the effect of this situation on the effectiveness and efficiency of computer education.

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APPENDIX A

LIST OF COMPUTER EDUCATION AND INSTRUCTIONAL TECHNOLOGY DEPARTMENTS IN TURKEY

Table A.1. Computer Education and Instructional Technology Departments in Turkey

No.	Üniversite / Fakülte	Şehir
1	Abant İzzet Baysal Üniversitesi Eğitim Fakültesi – BÖTE Bölümü	BOLU
2	Ahi Evran Üniversitesi Eğitim Fakültesi – BÖTE Bölümü*	KIRŞEHİR
3	Amasya Üniversitesi Eğitim Fakültesi – BÖTE Bölümü*	AMASYA
4	Anadolu Üniversitesi Eğitim Fakültesi – BÖTE Bölümü	ESKİŞEHİR
5	Ankara Üniversitesi Eğitim Bilimleri Fakültesi – BÖTE Bölümü	ANKARA
6	Atatürk Üniversitesi Kazım Karabekir Eğitim Fakültesi – BÖTE Bölümü	ERZURUM
7	Bahçeşehir Üniversitesi Fen Edebiyat Fakültesi – BÖTE Bölümü	İSTANBUL
8	Balıkesir Üniversitesi Necatibey Eğitim Fakültesi – BÖTE Bölümü	BALIKESİR
9	Başkent Üniversitesi Eğitim Fakültesi – BÖTE Bölümü	ANKARA
10	Bilkent Üniversitesi Eğitim Fakültesi – BÖTE Bölümü	ANKARA

Table A.1. (Continued)

No.	Üniversite / Fakülte	Şehir
11	Boğaziçi Üniversitesi Eğitim Fakültesi – BÖTE Bölümü	İSTANBUL
12	Çanakkale 18 Mart Üniversitesi Eğitim Fakültesi – BÖTE Bölümü	ÇANAKKALE
13	Çukurova Üniversitesi Eğitim Fakültesi – BÖTE Bölümü	ADANA
14	Doğu Akdeniz Üniversitesi Eğitim Fakültesi – BÖTE Bölümü	KKTC - GAZİMAĞUSA
15	Dokuz Eylül Üniversitesi Buca Eğitim Fakültesi – BÖTE Bölümü	İZMİR
16	Ege Üniversitesi Eğitim Fakültesi – BÖTE Bölümü	İZMİR
17	Erzincan Üniversitesi Eğitim Fakültesi – BÖTE Bölümü*	ERZİNCAN
18	Eskişehir Osmangazi Üniversitesi Eğitim Fakültesi – BÖTE Bölümü	ESKİŞEHİR
19	Fırat Üniversitesi Eğitim Fakültesi – BÖTE Bölümü	ELAZIĞ
20	Gazi Üniversitesi Gazi Eğitim Fakültesi – BÖTE Bölümü	ANKARA
21	Gaziosmanpaşa Üniversitesi Eğitim Fakültesi – BÖTE Bölümü	TOKAT
22	Girne Amerikan Üniversitesi Eğitim Fakültesi – BÖTE Bölümü	KKTC - GİRNE
23	Hacettepe Üniversitesi Eğitim Fakültesi – BÖTE Bölümü	ANKARA
24	İnönü Üniversitesi Eğitim Fakültesi – BÖTE Bölümü	MALATYA
25	İstanbul Aydın Üniversitesi Fen-Edebiyat Fakültesi – BÖTE Bölümü*	İSTANBUL
26	İstanbul Üniversitesi Hasan Ali Yücel Eğitim Fakültesi – BÖTE Bölümü*	İSTANBUL
27	Kahramanmaraş Sütçü İmam Üniversitesi Eğitim Fakültesi – BÖTE Bölümü*	KAHRAMANMARAŞ
28	Karadeniz Üniversitesi Fatih Eğitim Fakültesi – BÖTE Bölümü	TRABZON
29	Kırıkkale Üniversitesi Eğitim Fakültesi – BÖTE Bölümü	KIRIKKALE
30	Marmara Üniversitesi Atatürk Eğitim Fakültesi – BÖTE Bölümü	İSTANBUL

Table A.1. (Continued)

No.	Üniversite / Fakülte	Şehir
31	Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi – BÖTE Bölümü	BURDUR
32	Ondokuz Mayıs Üniversitesi Eğitim Fakültesi – BÖTE Bölümü	SAMSUN
33	Orta Doğu Teknik Üniversitesi Eğitim Fakültesi – BÖTE Bölümü	ANKARA
34	Sakarya Üniversitesi Eğitim Fakültesi – BÖTE Bölümü	ADAPAZARI
35	Selçuk Üniversitesi Ahmet Keleşoğlu Eğitim Fakültesi – BÖTE Bölümü	KONYA
36	Siirt Üniversitesi Eğitim Fakültesi – BÖTE Bölümü*	SİİRT
37	Trakya Üniversitesi Eğitim Fakültesi – BÖTE Bölümü*	EDİRNE
38	Uludağ Üniversitesi Eğitim Fakültesi – BÖTE Bölümü	BURSA
39	Yakındoğu Üniversitesi Atatürk Eğitim Fakültesi – BÖTE Bölümü	KKTC - LEFKOŞA
40	Yeditepe Üniversitesi Eğitim Fakültesi – BÖTE Bölümü*	İSTANBUL
41	Yıldız Teknik Üniversitesi Eğitim Fakültesi – BÖTE Bölümü	İSTANBUL
42	Yüzüncü Yıl Üniversitesi Eğitim Fakültesi – BÖTE Bölümü	VAN

*** Yeni Açılan Bölümler, 2008 ÖSYM Kılavuzu**

APPENDIX B

COMPUTER TEACHERS QUESTIONNAIRE

İLKÖĞRETİM OKULLARI BİLİŞİM TEKNOLOJİLERİ (BİLGİSAYAR) ÖĞRETMENLERİ ANKET FORMU

Bu anket, 2006–2007 eğitim-öğretim yılından itibaren ilköğretim okullarında uygulanmaya başlanan "İlköğretim Seçmeli Bilişim Teknolojileri (Bilgisayar) Dersi (1–8. Sınıflar) Öğretim Programı" ve bu programın uygulanmaya başlanmasıyla birlikte ilköğretim okullarında yaşanan mevcut durum hakkındaki düşüncelerinizi ve görüşlerinizi almak amacıyla hazırlanmıştır. Bir bilgisayar öğretmeni olarak sizin bu konudaki kişisel bilgi ve deneyimleriniz yapılan araştırma için büyük bir önem taşımaktadır. Vereceğiniz bilgiler sadece bilimsel araştırma amaçlı kullanılacaktır. Bu sebeple vereceğiniz cevapların gerçek düşüncelerinizi yansıtıyor olması büyük bir önem taşımaktadır. Bu çalışmalar sonucunda oluşturulacak belgelerde kimliğiniz doğrudan veya dolaylı bir şekilde kullanılmayacaktır. Araştırma tamamlandıktan sonra elde edilen bulguları eğer isterseniz sizinle paylaşmaktan mutluluk duyacağız. Araştırmamıza zaman ayırdığınız ve katkıda bulunduğunuz için şimdiden teşekkür ederiz.

Bil. Öğrt. Halise ŞEREFOĞLU HENKOĞLU
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BÖLÜM 1. KİŞİSEL BİLGİLERİNİZ VE KURUMUNUZ HAKKINDAKİ BİLGİLER

1. **Cinsiyetiniz: ( )** Bay **( )** Bayan
2. **Çalıştığınız kurumun türü: ( )** Devlet Okulu **( )** Özel Okul
3. **Görev yaptığınız okulun bulunduğu il: .....**
4. **Kaç yıldır bilgisayar öğretmeni olarak çalışıyorsunuz? .....**
   ( ) 1–3 Yıl **( )** 4–6 Yıl **( )** 7–9 Yıl **( )** 10 Yıl ve Üzeri
5. **Mesleğinizi severek mi yapıyorsunuz? ( )** Evet **( )** Hayır
6. **Görev yaptığınız okulda kaç tane bilgisayar sınıfı bulunuyor? .....**
   ( ) Bir **( )** İki **( )** Üç ve üzeri **( )** Bilgisayar sınıfı yok
7. **Bilgisayar sınıfınız var ise çalışır durumdaki toplam bilgisayar sayınız?.....**
   ( ) 5'ten az **( )** 6–10 **( )** 11–15 **( )** 16–20 **( )** 21 ve üzeri
8. **Bir ders saati boyunca öğrencileri derse hazır hale getirmek için ne kadar zaman harcıyorsunuz?**
   ( ) 1–5 Dakika **( )** 6–10 Dakika **( )** 11 Dakika ve Üzeri
9. **Bilişim Teknolojileri Dersi dışında yürüttüğünüz ders var mı? .....**
   ( ) Evet **( )** Hayır
   Cevabınız "Evet" ise:
   Bu derslerin isimleri nelerdir?

   Bu dersleri yürütme sebebiniz nedir?
   ( ) Zorunlu ders saatimi doldurmak için
   ( ) Bu derslerin branş öğretmeni olmadığı için
   ( ) Diğer (lütfen belirtiniz) .....

10. **Haftada toplam kaç saat dersiniz var?**
    Bilişim Teknolojileri: ( ) 10 Saatten az **( )** 10–15 saat arası **( )** 16 saat ve üzeri
    Diğer dersler: ( ) 10 Saatten az **( )** 10–15 saat arası **( )** 16 saat ve üzeri
    Toplam: ( ) 10 Saatten az **( )** 10–15 saat arası **( )** 16 saat ve üzeri
11. **Anket sonuçları hakkında bilgilendirilmek istiyorsanız e-posta adresinizi yazınız:.....**

BÖLÜM 2. BİLİŞİM TEKNOLOJİLERİ DERSİNE YÖNELİK TUTUMLARINIZ

Aşağıda Bilişim Teknolojileri Dersi'ne yönelik tutumlarla ile ilgili ifadeler verilmiştir. Bu ifadeler ile ilgili kendi düşüncelerinizi aşağıdaki ölçekte belirtiniz.

NO	İFADELER	Kesinlikle Katılıyorum	Katılıyorum	Kararsızım	Katılmıyorum	Kesinlikle Katılmıyorum
1	Yeni öğretim programı bir önceki programa göre öğretmenler açısından uygulaması daha kolay bir programdır.					
2	Yeni öğretim programı ile uygulamaya getirilen basamak ve seviyelendirme sistemi öğretim programının uygulanmasında kolaylık sağlamaktadır.					
3	Yeni öğretim programı eski programda olmayan birçok yeniliği beraberinde getirmiştir.					
4	Yeni öğretim programı zengin öğretim yöntemlerini içermekte ve bu sayede öğretmene programın uygulanmasında kolaylık sağlamaktadır.					
5	Yeni öğretim programı, dersi işlerken öğretmeni yönlendirmede (rehberlik etmekte) olumlu özelliklere sahiptir.					
6	Yeni öğretim programı, öğrencilerin günlük yaşamında kullanabilecekleri kazanımlara yer vermektedir.					
7	Yeni öğretim programının içeriği öğrenciler için uygun değildir.					
8	Yeni öğretim programı, içerdiği zengin öğretim yöntem ve teknikleri ile öğretmenlere dersi işlerken esneklik sağlamaktadır.					
9	Yeni öğretim programında yer alan etkinliklerin tamamlanması uzun zaman almaktadır.					

10	Yeni öğretim programının içeriği planlanan zamanda bitirilebilecek şekilde tasarlanmıştır.					
11	Yeni öğretim programı hazırlanırken, programın gerçek uygulayıcıları olan öğretmenlerin ve öğrencilerin ihtiyaçları göz ardı edilmiştir.					
12	Bilişim Teknolojileri dersi için ayrılan süre gerekli olan bilgi ve becerilerin öğrencilere aktarılması için yeterlidir.					
13	Ders saatlerinin azaltılması bilgisayar öğretmenlerinin zorunlu ders yüklerini doldurmalarını güçleştirmiştir.					
14	Dersin 1 saate indirilmesi, öğretmenin ders işlerken kullandığı öğretim yöntem ve tekniklerini seçmede belirleyicidir.					
15	Ders saatlerinin azaltılması öğrenciler üzerinde olumsuz bir etki yaratarak öğrencilerin derse olan ilgilerinin azalmasına sebep olmuştur.					
16	Ders saatinin azalması nedeniyle öğrencilerin bilgisayar ile uygulama yapmaları için yeterli zaman kalmamaktadır.					
17	Ders saatlerinin azaltılmasıyla birlikte diğer branş öğretmenleri arasında dersin önemsiz olduğu kanısı yaygınlaşmaktadır.					
18	Ders saatlerinin azaltılmasıyla birlikte öğrenciler arasında dersin önemsiz olduğu kanısı yaygınlaşmaktadır.					
19	Ders saatinin azaltılması bilgisayar öğretmenlerinin mesleki motivasyonları olumsuz etkilenmektedir.					
20	Ders saatinin azaltılması, yapılandırmacı yaklaşımı benimseyen yeni müfredat açısından uygun değildir.					
21	Öğrencileri derse hazır hale getirmek için belli bir zaman harcanması gerektiğinden dersin işlenmesi için gerekli zaman kalmamaktadır.					

22	Ders saatinin azaltılmasından dolayı derste yeterince uygulama yapılamaması öğrencilerin başarılarını olumsuz etkilemektedir.					
23	Bilişim Teknolojileri Dersi'nin seçmeli bir ders olması ve not ile değerlendirilmemesi dersin öneminin hâlâ anlaşılmadığının bir göstergesidir.					
24	Öğrenci performansının not ile değerlendirilmemesi öğrencilerin derse karşı olan ilgi ve motivasyonlarını azaltmıştır.					
25	Dersin not ile değerlendirilmemesi, öğrencilerin dersi bilgisayarda oyun oynama ve internete girme aracı olarak görmelerine sebep olmaktadır.					
26	Dersin seçmeli bir ders olması, öğrencilerin ve diğer branş öğretmenlerinin dersi bir eğlence dersi olarak görmelerine sebep olmaktadır.					
27	Bilişim Teknolojileri Dersi'nin verimliliğinin artırılabilmesi için ders zorunlu ders kapsamına alınmalıdır.					
28	Bilişim Teknolojileri Dersi'nin seçmeli bir ders olması bilgisayar öğretmenlerinin performansını olumsuz yönde etkilemektedir.					
29	Bilişim Teknolojileri Dersi'nin seçmeli bir ders olması öğrencilerin performansını olumsuz yönde etkilemektedir.					

BÖLÜM 3. BİLİŞİM TEKNOLOJİLERİ DERSİNE YÖNELİK ÖNERİLERİNİZ

Aşağıdaki tabloda ders işlenişi sırasında kullanılabilecek yöntem ve teknikler verilmiştir. Kendi ders işleyinişinizi düşünerek; Bilişim Teknolojileri Dersi 2 saat iken kullandığınız yöntem ve teknikleri birinci sütunda, ders saatinin 1'e düşürülmesinden sonra kullandığınız yöntem ve teknikleri ise ikinci sütunda işaretleyiniz. (Birden fazla seçeneği işaretleyebilirsiniz.)

KULLANDIĞINIZ YÖNTEM & TEKNİKLER		Bilişim Teknolojileri Dersi 2 saat iken	Bilişim Teknolojileri Dersi 1 saat iken
1	Gösteri		
2	Grup çalışması		
3	Proje tabanlı öğrenme		
4	Düz anlatım		
5	Drama		
6	Beyin fırtınası		
7	Soru-cevap		
8	Çoklu zekâ		
9	Buluş yoluyla öğretim		
10	Bütünleştirici (Yapısalcı) öğretim		
11	Problem çözme		
12	Diğer.....		

İlköğretim Bilişim Teknolojileri (Bilgisayar) ders programını siz yapıyor olsaydınız nasıl bir program oluştururdunuz? Aşağıda verilen seçenekleri işaretleyerek kendi programınızı gerçekleştiriniz.

SEVİYE		DERSİN NİTELİĞİ (DERS SAATİ & ZORUNLU VEYA SEÇMELİ OLMA DURUMU)							
		Olmamalı	1 Saat	2 Saat	3 Saat	4 Saat	5 Saat ve Üzeri	Zorunlu / Seçmeli	
13	İlköğretim 1							**( )** Zorunlu	**( )** Seçmeli
14	İlköğretim 2							**( )** Zorunlu	**( )** Seçmeli
15	İlköğretim 3							**( )** Zorunlu	**( )** Seçmeli
16	İlköğretim 4							**( )** Zorunlu	**( )** Seçmeli

17	İlköğretim 5							**( )** Zorunlu	**( )** Seçmeli
18	İlköğretim 6							**( )** Zorunlu	**( )** Seçmeli
19	İlköğretim 7							**( )** Zorunlu	**( )** Seçmeli
20	İlköğretim 8							**( )** Zorunlu	**( )** Seçmeli

21. Bilişim Teknolojileri (Bilgisayar) ders saati 1'e indirildikten sonra, eskiye kıyasla öğrenciler üzerinde ne gibi değişiklikler oldu? Bu konudaki gözlemlerinizi yazar mısınız?

22. Bilişim Teknolojileri (Bilgisayar) ders saati 1'e indirildikten sonra, derste kullandığınız yöntem ve tekniklerde herhangi bir değişiklik olduysa, bunun sebeplerini açıklayınız.

23. "İlköğretim Seçmeli Bilişim Teknolojileri Dersi (1–8. Sınıflar) Öğretim Programı"na ve bu programın ilköğretim okullarında uygulanışına ilişkin öneri ve fikirlerinizi lütfen yazınız.

Anket bitmiştir. Zaman ayırdığınız için teşekkür ederiz.