PRESERVICE AND INSERVICE BASIC EDUCATION COMPUTER TEACHERS' PROFESSIONAL GROWTH IN TERMS OF THEIR PERCEPTIONS OF TEACHING, PEDAGOGICAL COMPETENCIES AND SUBJECT MATTER KNOWLEDGE

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submitted by **RECEP ÇAKIR** in partial fulfillment of the requirements for the degree of **Doctor of Philosophy in Computer Education and Instructional Technology Department, Middle East Technical University** by,

Prof. Dr. Canan Özgen
Dean, **Graduate School of Natural and Applied Sciences** _______________

Prof. Dr. M. Yaşar Özden
Head of Department, **Computer Education and Instructional Technology** _______________

Assoc. Prof. Dr. Soner Yıldırım
Supervisor, **Computer Education and Instructional Technology Dept., METU** _______________

Examining Committee Members:

Prof. Dr. Ömer Geban
Secondary Science and Mathematics Education Dept., METU _______________

Assoc. Prof. Dr. Soner Yıldırım
Computer Education and Instructional Technology Dept., METU _______________

Assoc. Prof. Dr. Kürşat Çağıltay
Computer Education and Instructional Technology Dept., METU _______________

Assist. Prof. Dr. Yasemin Gülbahar
Computer Education and Instructional Technology Dept., Başkent University _______________

Assist. Prof. Dr. Yeşim Çapa Aydın
Educational Sciences Dept., METU _______________

Date: November 2008

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Name, Surname: Recep Çakır

Signature :

ABSTRACT

PRESERVICE AND INSERVICE BASIC EDUCATION COMPUTER TEACHERS' PROFESSIONAL GROWTH IN TERMS OF THEIR PERCEPTIONS OF TEACHING, PEDAGOGICAL COMPETENCIES AND SUBJECT MATTER KNOWLEDGE

Çakır, Recep

Ph.D., Department of Computer Education and Instructional Technology

Supervisor : Assoc. Prof. Dr. Soner Yıldırım

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The purpose of this study was to investigate the professional growth of the preservice and inservice Basic Education computer teachers. To understand their professional growth in terms of perception of teaching and competencies about pedagogic and subject matter knowledge, questionnaires were administered to 1,568 preservice teachers and 104 inservice teachers in Turkey.

In order to seek answers to this broad purpose, mixed research method including both quantitative and qualitative traditions was used in this study. The researcher employed the questionnaires as the primary data collection tool but since questionnaires were limited in the representation of the whole picture, this study was complemented by interviews, observations and document analysis, which were the qualitative data collection tools. To that end, 33 preservice computer teachers and 12 inservice teachers were interviewed. Besides these, 8 preservice and 4 inservice classroom observations were conducted. Additionally, their lesson plans were analyzed throughout the data collection process.

Regarding data collecting procedure, the data collection and analysis procedure includes two phases; the first one is the quantitative phase, in which the research questions focus on basic education computer teachers' perceptions about teaching, their pedagogical and subject matter competencies and their views about technology integration into schools. In order to answer the research questions, the researchers developed new questionnaires and adapted from existing instruments by utilizing the literature review and taking expert opinions. After this phase, pilot studies were conducted in order to ensure reliability and validity of the questionnaires. In the second part, which is the qualitative phase, the research questions were addressed for in-depth understanding of preservice and inservice computer teachers' perceptions toward teaching, their competencies and their opinions about technology integrations. For this purpose, interviews and observation schedules were prepared under the guidance of experts and with the support of the related literature.

Results revealed that preservice and inservice teachers' perceptions of teaching were generally positive about computer education. Moreover, their competencies increased throughout years. However, results indicated some negative points in their perceptions and competencies. Pertaining to the measured variables, there significant differences were found among preservice teachers based on their year in the program. Interviews and observations that were conducted to gain in-depth understanding of teachers' progress in their professional growth supported the survey results. This study elicited important results for preservice and inservice computer teachers and teacher educators to understand the whole picture of the Basic Education computer teaching. Results of this study, particularly those related to the problems they encounter in the profession, could provide new directions for the Ministry of National Education, the Higher Education Council, and universities.

Keywords: Professional Growth, Perception of Teaching, Pedagogical Competency, Subject Matter Competency, Computer Teacher Training

ÖZ

İLKÖĞRETİM BİLGİSAYAR ÖĞRETMENİ VE ÖĞRETMEN ADAYLARININ ÖĞRETMENLİK ALGILARI İLE PEDAGOJİK VE KONU ALANI BİLGİSİ YETERLİKLERİ BAKIMINDAN MESLEKİ GELIŞMELERİ

Çakır, Recep

Doktora, Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü

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Bu çalışmanın amacı ilköğretim bilgisayar öğretmeni ve öğretmen adaylarının mesleki gelişimlerini araştırmaktır. Öğretmenliğe karşı algıları ile pedagojik ve konu alanı yeterlikleri bakımından mesleki gelişimlerini anlamak için tüm Türkiye genelinde 1,568 öğretmen adayı ve 104 bilgisayar öğretmenine anket uygulanmıştır.

Bu geniş amaca cevap bulmak için, nitel ve nicel yöntemleri içeren karma araştırma yöntemi kullanılmıştır. Araştırmacı öncelikli data toplama aracı olarak anket kullanmıştır, fakat anketlerin bütün resmi ortaya koymada bazı sınırlılıkları olduğundan bu calışma görüşmeler, gözlemler ve döküman analizi teknikleri olan nitel araştırma yöntemleri ile tamamlanmıştır. Bu amaçla, 33 bilgisayar öğretmeni adayı ve 12 öğretmen ile görüşmeler yapılmıştır. Bununla birlikte, 8 öğretmen adayı ve 4 öğretmenin dersleri gözlemlenmiştir. Ayrıca onların ders planları data toplama süreci içinde incelenmiştir.

Data toplama prosedüründe, öncelikle çalışmanın nicel kısmı olarak, araştırmanın soruları bilgisayar öğretmeni ve öğretmen adaylarının mesleki algıları, onların pedagojik ve konu alanı yeterlikleri ve teknoloji entegrasyonuna karşı düşüncelerine odaklanmıştır. Araştırma sorularına cevap bulmak için araştırmacı alanda literatür çalışmalarından ve

uzman görüşlerinden yararlanarak yeni anketler geliştirmiş ve var olan araçları uyarlayarak kullanmıştır. Daha sonra, anketlerin geçerlik ve güvenirliklerini tespit etmek için pilot çalışmalar yapılmıştır. İkinci kısımda, nitel olan araştırma soruları bilgisayar öğretmeni ve öğretmen adaylarının mesleğe karşı algıları, pedagojik ve konu alanı yeterlikleri ve teknoloji entegrasyonu hakkındaki düşüncelerini derinlemesine anlamaya odaklanmıştır. Bu amaç için, arastırmacı tarafından uzman görüşü alınarak ve alandaki literaturden yararlanarak görüşme ve gözlem formları hazırlanmıştır.

Sonuçlar, bilgisayar öğretmeni ve öğretmen adaylarının mesleğe karşı algılarının genelde pozitif olduğunu göstermektedir. Ayrıca yeterliklerinin yıllar geçtikçe arttığı görülmektedir. Fakat, araştırma sonuçları öğretmenlerin ve öğretmen adaylarının mesleğe karşı algılarında ve yeterliklerinde bazı olumsuz noktaların olduğunu da göstermektedir. Bununla birlikte, ölçülen değişkenler açısından bilgisayar öğretmeni ve öğretmen adayları arasında yıllara göre anlamlı farkların olduğu gözlenmiştir. Öğretmen ve öğretmen adaylarinin mesleki gelişimlerindeki değişimi derinlemesine anlamak için kullanılan görüşme ve gözlem sonuçları anket sonuçlarını desteklemektedir. Bu çalışma İlköğretim bilgisayar öğretmenliğinin resmini ortaya koyması bakımından bilgisayar öğretmeni ve öğretmen adayları ve öğretmen eğitimi için önemli sonuçlar içermektedir. Ayrıca bu çalışmanın sonuçları, özellikle bilgisayar öğretmenliğinde karşılaşılan problemlerle ilişkili olarak, Milli Eğitim Bakanlığı, Yüksek Öğretim Kurulu ve üniversitelere yeni yönelimler önermektedir.

Anahtar Kelimeler: Mesleki Gelişim, Öğretmenlik Algısı, Pedagojik Yeterlik, Konu Alanı Yeterliği, Bilgisayar Öğretmenliği Eğitimi

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LIST OF ABBREVIATIONS

AECT: Association for Educational Communications and Technology,

BECTA: British Educational Communications and Technology Agency

CBE : Computer based Education

CEIT: Computer Education and Instructional Technology

CMC: Computer-mediated communication

HEC: Higher Education Council (YÖK)

ICT: Information and communication technologies

ISTE: International Society for Technology in Education

IT: Instructional technology

K-8: Kindergarten through the eighth grade

MANOVA : Multivariate Analysis of Variance

METU: Middle East Technical University

MoNE: Ministry of National Education of Turkey

NETS: National educational technology standards

OECD: Organization for Economic Co-operation and Development

TPoT: Teachers' Perception of Teaching Questionnaire

SPSS: Statistical Package for the Social Sciences

CHAPTER 1

INTRODUCTION

This section reveals the justification for the research by presenting background of the study, significance of the study, purpose of the study and the research questions. Besides these, the definitions of the terms for the study are defined at the end of this chapter.

1.1. Background of the Study

1.1.1. Technology Integration into Classroom

The integration of technology into the classroom is inescapable in today's education. Teachers' using technologies in the classroom change students' learning (Barron, Kemker, Harmes, & Kalaydjian, 2003). Morrison and Lowther (2004) illustrates this stating that computers can make a difference in student learning when teachers change the way they make students use computer technology in the classroom. Ertmer (1999) also reported that although there is a high expectation from teachers to integrate technology in to educational activities, how this put into practice is still dilemma.

Barron et al (2003) states that though teachers use technology in their basic level task, they do not use it in their complex activities. Supporting this idea, Newman (2002) reported that teachers know to get information from the internet and they send e-mail easily, only some of them use advanced tools and software to improve their lessons. Ertmer (2005) also highlights that, "in the USA the computer- related activities in which teachers most often engage their students include expressing themselves in writing, improving their computer skills, doing research using the Internet, using computers as a free-time or reward activity, and doing drill and practice" (Ertmer, 2005, p2). Similar situations are apparent in Turkey as well. For example, according to the data supplied by the Ministry of National Education (MoNE), there is almost no primary school providing education without computer support (OECD report, 2005). Although MoNE offers inservice training courses in order to increase the efficient use of computer technologies by teachers, whether these computer technologies in schools are used efficiently is a point of discussion.

It is obvious from the literature that the integration of technology into the education processes depends on the teachers' uses of these technologies. It is also quite obvious that the computer teachers assume a great role in the integration of the technology in schools in Turkey. In the literature review, the views and capabilities of teachers regarding the profession of teaching indicate that teachers' level of computer literacy and their attitudes toward technology do effect the integration of technology. In a recent report issued by the MoNE, it is stated that the quality and accessibility of education are further increased in the some big projects (OECD report, 2005). For that aim, since 1997, there have been great effort to inform teachers about information and communication technologies (ICT) via preservice and inservice training programs, to make education programs and books more ICT-based, and to spread guidance and consultation services (OECD report, 2005).

Parallel with these reforms, MoNE has decided to change curricula in elementary education in Turkey. According to the MoNE authorities, it is mandatory to change the curriculum because it clearly appeared that there have been many changes and developments in our country such as in demographic structure, parents' qualities, cultural area, human rights, political area, science and technology (Cakir, 2006). Therefore, it is necessary that these developments must be integrated into educational system. So, by doing such changes, necessities of the future world will be provided (MEB Komisyon, 2004). To that end, MoNE has redesigned all curricula from 1st level to 5th level in elementary school and new curriculum has come into practice in pilot schools in 2004-2005 academic year. Therefore, this study gives important information to educators and administrators in preparing new curricula for technology education in side of computer teacher training.

1.1.2. Professional Growth of the Teachers

Professional growth is defined as changes of the behavior, knowledge, images, beliefs or perceptions of teachers (Clarke & Hollingsworth, 2002; Grossman, 1992; Kagan 1992; Ross & Bruce, 2007). In the literature, studies (Clarke & Hollingsworth, 2002; Grossman, 1992; Kagan, 1992; Nettle, 1998; Ross, 2001) highlight the importance about the preservice teachers' professional growth for teacher training. Therefore, it is needed to conduct studies in Turkey about preservice teachers' professional growth. The present study provides rich descriptions about basic education computer teachers' professional growth with questionnaires, classroom observations and interviews. On the other hand, regarding the stages and teaching practices which are the invaluable to teacher educators who could use them to infer the nature of teacher, education programs most likely promote professional growth. Based on professional growth, teachers' classroom practices positively change after significant changes in beliefs and attitudes. Changing teachers' practices also leads to change students learning outcomes (Kagan, 1992).

According to the context of the teachers' professional growth, teacher education programs should incorporate courses that offer ways to construct teachers' knowledge in a coherent way in addition to exposing preservice teachers to the theoretical aspects of teaching (Kagan, 1992). However, preservice teachers may exhibit instructional practices inconsistent with the theory, but consistent with their experiences and the way they best learned during their teaching practices (Raymond, 1997; VanLeuvan, 1997). Teacher training programs in universities connect the theory courses with everyday life. In other words, the courses taught to the teacher candidates should be in harmony with the teaching practice. According to Koca and Sen (2006), teachers take and adopt the training offered in schools, and shape this training in accordance with their own education views and thoughts. Seferoğlu (2004) also puts forth that societies aiming at catching the era and further developing should attribute the required importance and the value to the profession of teaching and teachers.

1.1.3. Teachers' Perception of Teaching

In this aforementioned context of the professional growth, student teachers' views about teaching are one of the most important aspects, before they start to teach in schools. (Doolittle, Dodds & Placek, 1993; Griffin, 1989; Tabachnick & Zeichner, 1984). Therefore, teacher educators should need to understand the perceptions and belief structures of teacher candidates in order to improve professional preparation and teaching practices (Koca & Sen 2006). In a previous study, Saban (2003) affirms that while there is a body of research dealing with preservice teachers' reasons for teaching, beliefs about teaching and with the attitudes to the teaching profession from all over the world, further investigation is needed in order to illuminate the similarities and differences in teaching images that preservice teachers transport them as they enter teacher training programs in different socio-cultural contexts.

1.1.4. Teachers' Competencies

Based on teachers' professional growth, teachers' competencies (e.g. pedagogical and subject matter) are studied in order to understand their professional growth. In addition, this value is about taking the necessary steps and measures beginning from the training to assignment of teachers, from their conditions of work to the systems of working. Besides, educational program cannot be successful unless teachers have fully competent in their required fields of expertise and education processes (Miller & Miller, 2002). Thus, the key variant expected in today's world is the fully competent teachers.

In schools, teachers teach whatever was taught to them in universities. Researchers claim that the courses and teaching practices offered to teachers in their own schools affect their future careers, along with the effect of the experienced teachers on the teacher candidates (Nettle, 1998). Therefore, examining preservice teachers' thoughts about their careers and their competencies is one of the most essential issues to understand their professional growths in their teaching professions.

With regard teachers' competencies, today's schools require teachers who have repertoire of effective teaching strategies to meet the needs of all students. A teacher' repertoire consists of the number of teaching approaches and strategies he or she uses to facilitate students for learning effectively. Arends (2001) stresses that effective teaching requires careful and reflective thought about what a teacher is doing and the effects of his or her accomplishment on students' social and academic learning. In addition to this, the availability of the new technologies such as internet and its implications are already having an effect on teaching and learning activities. Incorporating a variety of teaching and learning strategies supported by technology have an obvious effect on students' outcomes. Using teaching strategies that have a solid theoretical base makes the computer a more effective tool in teaching activities. Therefore, teachers use teaching strategies to integrate technology into classroom (Sharp, 1999). Pierson (2001) supported this by explaining that one part represents technical and the other side represents pedagogical knowledge. Therefore, teachers need subject matter knowledge integrated with both technological and pedagogical expertise. When educators apply various teaching strategies, they reflect their beliefs in individual learning styles and preferences, and become more apt to engage students in the successful obtaining of knowledge.

The preparation for teaching as a job requires general knowledge, subject matter knowledge and pedagogical knowledge. In order to acquire these capabilities, the system is based on teacher candidates with higher education regardless of their level in the system. In Turkey, teacher training programs are dominated with the subject knowledge on the field and the pedagogical knowledge. The number and the content of general training courses may vary from one university to another and they may be different among departments (Koca & Sen, 2006). Therefore, it is extremely essential to search the views and competencies of basic education computer teachers who continue their education or graduated from different universities.

1.1.5. Computer Teacher Training

Besides the aforementioned issues, the Higher Education Council (HEC) redesigned the curricula of faculty of education in 1998 in Turkey. At that time, Computer Education and Instructional Technology (CEIT) departments were opened in the faculties of education to prepare the ground for implementing the rapidly developing technologies in schools. Nowadays, there are 42 CEIT departments, including some recently opened ones (in 2008), at universities in Turkey (OSYM, 2008). Students who graduated from these departments serve as computer teachers in basic education schools (K8) in both state and private schools. On the other hand, when preservice computer teachers finish their university education, they become competent both in subject matter and in pedagogic domain. Since when they become teachers their major role will be integrating technology—especially computer technology—into their lesson, they must be competent both in subject matter and the pedagogic domain before they become teachers. One of the most consistent findings concerning teaching is that effective teachers maintain a balance between specific strategies designed to manage student behavior in the classroom and instructional strategies (Gilberts & Lignugaris-Kraft, 1997). Moreover, planning and preparation are major themes for incorporating technology (Brush, Glazewski, Rutowski, Berg, Stromfors, Van-Nest, Stock, & Sutton; 2003).

Research focusing on the experience of practitioners suggests that if appropriate technology is used, it will improve students' learning (Schacter, 1999). In Turkey, effective use of technology in classes depends on teachers, who both serve as computer teachers in schools and informally mentor other teachers' use of technology. Because it is assumed that one's attitudes towards teaching, as well as knowledge about technology use and integration, are important to the integration of technology (Hardy, 1998). Hardy also emphasizes that the teacher is the central figure in deciding to use technology, as his/her attitudes toward and perception of technology and knowledge about computer technology affect the technology integration into the classroom.

To dwell further on the argument above in the literature, according to Hunter (1976) successful teaching is not based on what a teacher is, but on what a teacher does in planning and implementing those plans in the teaching- learning process. To be a successful in teaching carrier, teachers need to be capable of both pedagogical and subject matter knowledge (Pierson, 2001). According to Arends (2001), teachers are increasingly expected to have advanced preparation and to demonstrate their knowledge of both subject matter and pedagogy.

At the same time, reform studies in education system have been carried out in many countries, including Turkey, in recent years. Among the most important factors of the reform process are the teachers (Battista, 1994). The judgments, views and the perceptions of teachers are some of the important aspects of the reform process (Smith, 1996). Especially the realization of the efficient teaching practices by teachers depends directly on their perceptions and competencies (Dunkin, 1997; Smith, 1996; Şişman & Acat, 2003; Tamir, 1998). In order to develop an efficient teacher training program, it is of great importance to determine the above-mentioned characteristics of the student teachers who choose teaching as a profession.

As a conclusion, the present study aims to portray basic education computer teachers' professional growth in terms of their perceptions about teaching and their competencies. In fact, the major concerns of the study are to reveal the connections between the subject area and its instruction and to understand the effective teaching and learning environment in computer teaching. The relationship between computer teacher training and instructional practice in the field and, if any, the changes in their perceptions both as preservice and inservice teachers are other concerns of the study. Moreover, this large study examines how preservice and inservice computer teachers who are equipped with content, technological and pedagogical knowledge face challenges in their teaching.

Moreover, the present study prepare a ground for further research about professional growth of the preservice and inservice teachers in Turkey by presenting an outline of how computer teachers perceive teaching and dwells on their pedagogic and subject matter competencies.

1.2. Significance of the Study

Teachers' thoughts about teaching are important factors in the school environment for meeting the schools' missions and visions, since students' achievement and attitudes toward school are dependent on teachers' practices and their professional growth (Brookhart & Freeman, 1992; Mahlios & Maxson, 1995; Weinstein, 1989; Wilson & Cameron, 1996). Researchers also indicate that teacher' perceptions of effective teaching change throughout their years of preparation. Furthermore, preservice teachers' preconceptions about the teaching profession are noteworthy since it is very likely that teacher education students will one day be teachers in school.

In this study, therefore, preservice and inservice computer teachers' professional growth are examined cross-sectionally by focusing on sophomores, juniors and seniors in preservice computer teaching training programs and on the experiences of inservice teachers. Therefore, the results of this study might shed light on who actually choose computer teaching as profession, how computer teachers are prepared, and what career paths they follow.

On the other hand, teaching and learning processes having a dynamic structure with all its dimensions make it necessary for teachers to question and develop the qualities required by the responsibility. Demirel (1999) stresses that teaching is a domain of special expertise where one assume the education and the related management mission of the government.

Furthermore, when computer teachers are thought as responsible for integrating technology into education and when the fast development of technology is taken into consideration, computer teaching also has to be continuously questioned and developed when necessary. In this research not only the professional growth process of preservice computer teachers at 2nd grade, 3rd grade and 4th grade but also the experiences of the inservice teachers serving at schools and their environment are examined.

Furthermore, educators agree that integrating technology into curriculum plays a major role in shaping rich teaching and learning environment (Byrom & Bingham, 2001; Clements & Sarama, 2003; Hew & Brush, 2007; Kulik, 2002; Schware, & Jaramillo, 1998; Waxman, Connell & Gray, 2002; Waxman, Lin, & Michko, 2003; Yildirim, 2007). However, putting technology into classrooms is only a part of the task. The ultimate goal of integrating technology is to allow students to use technology as a prominent facet of their classroom context. In Turkey, it is computer teachers who are primarily responsible for integrating technology into K8 classrooms and informally mentor other teachers' use of technology. This study examines preservice and inservice computer teachers' technological and pedagogical capabilities and their current preparedness for technology integration. Their views regarding putting technology into practice are observed. Assuming that they are computer literate, it is important to understand how they integrate technology into their lessons or whether they can integrate it or not. Therefore, result of this study shed light on computer teachers' awareness of the importance of integrating technology in their teaching and learning activities. How technology could be used effectively in the classroom is also touched upon in this study.

Moreover, the results of this study present significant information to teacher educators who develop and evaluate teacher training programs. Important suggestions are made to preservice computer teachers to be not only good teachers but also effective technology integrators in schools. In addition, this study also presents an encompassing picture of the computer teacher training faculties by observing computer teachers' professional growth and determining existing situations. Since this study is one of the first studies about computer teachers in Turkey, the results of this study are also important for HEC, MoNE, policy makers as well as for teacher education programs. Therefore, it is clear that this study may guide educators and administrators for preparing new curricula to implement technology in education and for computer teacher training.

1.3. Purpose of the Study

Teachers' strengths, weaknesses, biases, personalities, and all those other characteristics make them individuals (Kelly & Kelly, 1985). As in other professions, teachers' individual attributes are reflected in their work. In the field of education, this is particularly important because teachers' perspectives may impact students' gains in the classroom. There is a body of literature about teachers' characteristics of teaching that suggesting a strong connection between teachers' perceptions and practices (Corcoran, 1981; Labrana, 2007; Macnab & Payne, 2003; McDiarmid. 1990; Parker, 1998; Weinstein, 1989; Woods, 1998). However, a few studies are identified (Deryakulu & Olkun, 2007) about computer or technology teachers' characteristics of teaching and how these points manifest in their teaching practices.

Moreover, using effectively Information Technology (IT) classes which were established by the MoNE depends on computer teachers in schools. Teachers' attitudes towards integrating technology, their knowledge about their subject and using technology effectively in classroom settings are quite important to integrate technology in classroom settings. Especially, computer teachers' competencies, thoughts about teaching, interaction between students and other teachers in schools and problems which are faced regarding technology integration are critical factors to use technology effectively in schools. Since one of the most essential roles of the computer teachers are to provide and guide integrating technology in schools, departments which train these future teachers are examined in the present study.

Therefore, the purpose of this study is twofold. The main purpose of this study is to investigate the professional growth of the basic education computer teachers in terms of their perception of teaching and their competencies. The second, this study also focuses on how computer teaching occurs in the class and how the effective teaching and learning environment in computer teaching occurs. To that end, the research puts an emphasis on computer teachers' field experiences to understand the effect of technology-supported teaching on their practices. Therefore, how they use their skills in the classroom setting was also investigated in this study. This broad study aims to find answers to the following research questions and sub-questions

1.4. Research Questions

This study investigated the following main research questions:

1) What is the professional growth of the basic education computer teachers in terms of their perceptions towards teaching and their competencies?
2) To which extend do basic education computer teachers use their pedagogical and subject matter skills in their teaching practice?

In order to have a broad insight of this study the following sub-questions were answered;

1.4.1. Sub-questions

RQ1) What is the professional growth of the basic education computer teachers in terms of their perceptions towards teaching and their competencies?

1.1. What are the perceptions of preservice and inservice computer teachers about teaching as a profession?

1.2. What are the preservice and inservice computer teachers' pedagogical competencies?

1.3. What are the preservice and inservice computer teachers' subject matter competencies?

1.4. What are the preservice teachers' opinions on factors that contribute to successful technology integration in schools while they practice teaching?

1.5. What are the inservice teachers' opinions on factors that contribute to successful technology integration in schools at which they work?

1.6. In what ways preservice teachers differ from each other across their university years in terms of perception of teaching?

1.7. In what ways preservice teachers differ from each other across their university years in terms of pedagogical competencies?

1.8. In what ways preservice teachers differ from each other across their university years in terms of subject matter competencies?

1.9. Is there any mean difference in preservice computer teachers' perception of teaching, pedagogical competencies and subject matter competencies based on their high school education?

1.10 Is there any mean difference computer teachers' perception of teaching, pedagogical competencies and subject matter competencies based on gender?

RQ2) To which extend do basic education computer teachers use their pedagogical and subject matter skills in their teaching practice?

2.1. How are the preservice and inservice computer teachers' perceptions towards teaching?

2.2. How do preservice computer teachers apply their pedagogical and subject matter knowledge in their teaching practice?

2.3. How do inservice computer teachers apply their pedagogical and subject matter knowledge in their teaching practice?

2.4. Which factors (e.g., environmental and professional factors) do affect computer teachers' perceptions towards teaching?

2.5. How these factors (e.g., environmental and professional factors) do affect their teaching practices?
2.6. How preservice computer teachers' perceptions do affect their pedagogical and content knowledge during teaching activities?
2.7. How inservice computer teachers' perceptions do affect their pedagogical and content knowledge during teaching activities?

As can be seen in the research questions, the results of this study give important information to all stakeholders who deal with teacher trainings (e.g. MoNE, HEC, universities teacher educators etc.) for better understanding the current status of computer teaching and computer teachers in schools and universities. Therefore, while they develop teacher education programs, they pay attention to the relationship between program content and student teachers perceptions. Teacher educators also focus on preservice teachers' pedagogical and subject matter knowledge to form a program.

For the purposes of this study, qualitative and quantitave methods are combined as mixed method sequential explanatory design (i.e., questionnaires, interviews and observation). Chapter 3 gives more detailed information about the methods of the study.

1.5. Definition of the Terms

Technology integration

Many educators, authorities, teachers and parents now see technology as a part of the high quality education. There is no exact definition of technology integration in K-8 schools in the literature (Hew & Brush, 2007). However, from some researches it is generally understood and examined in terms of types of teachers' computer use in the classrooms. Therefore, in the present study the use of technology and its integration are mainly taken with regard to the use of computer and its technologies in teaching and learning activities in basic education schools.

Computer Teacher Training

Computer teachers who serve in basic education are mostly graduated from departments of the Computer Education and Instructional technologies (CEIT) in faculties of education. These departments have been established in order to train computer teachers for K-8 schools (YÖK, 1998). Preservice teachers who are graduated from these departments are employed by both MoNE and private schools as computer teachers. Courses in computer teaching training, like those in other teacher training programs, include the pedagogical domain, the special subject teaching domain and the general culture domain. Furthermore, the teaching practicum takes place in three sessions throughout the 4-year teacher training program. One is school experience during the second semester of the first year, and the other two which is called teaching practice take place in the first and second semesters of the fourth year.

Professional Growth

In the related literature, professional growth defined as changes of the behavior, knowledge, images, beliefs or perceptions of teachers (Kagan, 1992). Therefore, in this study professional growth is related to the changes in preservice and inservice computer teachers' perceptions of teaching and their knowledge about pedagogical and subject matter throughout their professional careers.

Perception of Teaching

Perception is defined in the literature as a process of interpreting and understanding information (Ashcraft, 2002). In the present study, perception of teaching is handled in terms of preservice and inservice teachers' thoughts of their future careers (e.g., teaching, teaching environment, teachers' roles etc.). Researchers claim that teachers' perceptions about their teaching as a profession influence their effectiveness and their ability to deal with educational change and to apply innovations in their teaching activities (Beijaard, Verloop & Vermunt, 2000).

Teacher Competencies

In this study teacher competencies are accepted as the level of the teacher's possessing of the required knowledge and skill such as pedagogical and subject matter knowledge in order to realize teaching effectiveness (Dunkin, 1997).

Pedagogical Knowledge

Pedagogical knowledge is to acquire some skills including the processes and practices involved in classroom management, lesson plan, and implementation. It also contains knowledge about teaching methods to be used and strategies for evaluating students' understanding.

Subject Matter Knowledge:

Subject matter knowledge is the knowledge about the content which is to be learned or taught (Ball & McDiarmid, 1990, Mishra & Koehler (2006). Subject matter knowledge concerns concepts, theories, procedures, and implementations within the field. Moreover, it is taken in the present study with regard to preservice and inservice computer teachers' understanding and implementing this knowledge during the courses on the use of computer technology.

CHAPTER 2

REVIEW OF LITERATURE

2.1. Introduction

This study focuses on preservice and inservice basic education computer teachers' professional growth in terms of their perception of teaching and their pedagogic and subject matter competencies. This section of the study explains related literatures regar ding the purpose of this study. The databases that have been searched in literature reviews were general sources (e.g. abstracts and indexes), primary sources (e.g. journals) and secondary sources (e.g. textbooks) (Fraenkel & Wallen 2000). The following related literature assisted to shape the development of the research questions of this study;

1) Technology in education
2) Integrating technology into education
3) Factors affecting technology integration into education
4) Training of the computer teacher
5) Professional growth of teachers
    - Perception of teaching
    - Teacher competencies
        - ♦ Pedagogical competency
        - ♦ Subject matter competencies

2.2. Technology in Education

Though education technology is a continuously developing and changing field, subject experts are still trying to define this field. When looked at the historical development, education technologies have found an important application field in a rather short period of time (Hannafin & Savenye, 1993; Gentry, 1995; Molenda, 2004; Reiser, 2002; Seels, & Richey, 1994; Spector, 2001).

As information technology has affected the whole society and its surrounding all over the world, the use of technology in education is gaining inevitable impetus as it improves learning for students. Definition of educational technology varies among the practitioners, researchers and authorities. For example, according to Gentry (1995), the field of educational technology has employed a broad variety of meaning during its quite short period of evolution. There are some examples of definition below:

Association for Educational Communications and Technology (AECT) defines educational technology as "complex, integrated process involving people, procedures, ideas, devices and organization for analyzing problems and devising, implementing, evaluating, and managing solutions to the problems involved in all aspects of human learning", p.2 (AECT, 1977).

According to Reiser (2002), not only the definition changed but also the name has frequently changed. Over the years, names such as audiovisual instruction, audiovisual communications have been defined as education technologies. Reiser defines instructional technology as "the field of instructional design and technology that encompasses the analysis of learning and performance problems and the design, development, implementation, evaluation and management of instructional and non-instructional processes and resources intended to improve learning and performance in a variety of settings, particularly educational institutions and workplaces", p.12.

Molenda (2004) defines the term as: "Educational technology is the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources" p.1.

Spector (2001) states that educational technologists have promised that great advances and improvements in learning and instruction would occur because of new and emerging technologies

As can be observed in the definitions presented above and the views of authors, there are similarities and differences between them. It can also be seen that definitions change according to the point of view and the type of project worked on. When looked at in this way, it is doubtless that the different definitions can be listed under various other definitions, though it should not be overseen that some of the opinions can be completely different from each other. This helps us settle everything in place, make basic variations, and determine orientations (Gentry 1995.

Apart from the definitions, since the material and methods used in educational technologies are handled, tools such as projectors, blackboards and textbooks are used to let teachers more efficiently. One of the purposes of technology education is to prepare students to become technologically literate society. Dyrenfurth, Hatch, Jones, and Kozak (1991) note that technological literacy is multi-dimensional since it consists of practical dimension (the ability to use technology), civic dimension (the ability to understand the issues raised by the use of technology), and cultural dimension (the appreciation for the significance of technology). Students who have positive attitude to technology can gain technology literacy through education only if one of the aims of education system is to achieve technology literacy among students (Mcnamara, Grant and Wasser, 1998).

Hannafin and Savenye (1993) emphasizes that in the 1960s studies educational technologies such as instructional radio and films were seen as effective as traditional classroom instruction. Viadero (1997) also underlines that computer-based education makes equivalent student's achievement possible when compared to other types of methods.

Most of the studies reveal positive relationship between technology and students' outcomes at all levels of education and subject areas (Edyburn, Higgins & Boone, 2005; Fox, 2005; Lee, 2000; Kramarski & Feldman, 2000; Viadero, 1997; Waxman et al., 2002). In addition to these, results in technology-rich environment studies show the general effects of technology on student' motivation and attitudes towards class are possibly greater than previous (Keller & Suzuki, 1988; Kulik, 2002). Recent research also indicates that if technology is used appropriately, it can be very beneficial to enhance educational productivity such as achievement, learning style, attitude, working cooperatively and reaching information easily (Barronet al., 2003; Byrom & Bingham, 2001; Clements & Sarama, 2003; Hew and Brush, 2007; Kulik, 2002; Waxman et al., 2002; Waxman et al., 2003; Yildirim, 2007)

It is doubtless that the rapid progress in technology in the recent years has directly affected the Turkish education system in many ways. Computers, as it is widely known, are used in various purposes in the education system. This situation makes some changes in the educational environment necessary in the Turkish educational system. For example, the reorganization of physical environment, the change of program content and teaching methodologies caused teachers to be instructed on computer literacy and computer-supported education subjects (Akkoyunlu, 1988). The qualities teachers possess are of vital importance for the effective usage of computers as teaching material. ISTE (International Society for Technology in Education) determined the teacher standards in terms of quality as in the following;

1) being computer literate,
2) being able to use technology in classes,
3) being able to direct students to using technology,
4) helping the students gain skills in reaching and using information,
5) organizing the teaching environment so that the students can use technology,
6) planning, applying, preparing and presenting technology supported lessons in order to raise the higher order skills and creativity of the students,

7) being able to analyze, interpret and share the acquisition of the students by using technology resources,
8) being able to cooperate with colleagues over the internet for professional development and sharing of experience,
9) transferring ethic rules about reaching healthy, affective and realistic resources (ISTE, 2000).

Moreover, using appropriate technology in education;

- provide students with easily accessing to materials,
- organize and manage the learning activities in the classroom
- allow valid and accurate assessment of students' progress (Berge & Collins, 1998)

On the other hand, Cuban, Kirkpatrick & Peck (2001) have noted that a few teachers (less than 20%) use technology many times in a week, while many teachers do not use technology in their teaching activities.

Due to the fast development of technology and to be able to use the developments in all areas, the MoNE in Turkey has been working on the usage of computers in the teaching environment. MoNE has been conducted studies on the fields of establishing computer laboratories in schools, computer literacy, developing the curriculum, training teachers who can use technology and who can teach the use of technology. The quality of the teachers who use computers in the education period, the wide spread of computers in the education system and the unifying with the period are seen as of major importance. Teaching training program has been organized and teachers have been trained in these programs in order to be able to train teachers who serve in primary and secondary schools on the subject of computer usage. MoNE has also prepared inservice training programs in cooperation with universities in order to widespread the usage of computers in education. Furthermore, MoNE is holding formator teachers training programs in various universities since 1991 through directorate of the inservice department of the MoNE (Orhan & Akkoyunlu, 2003).

In an increasingly technological world, technology education programs designed to meet the needs of the demanding technological environment must be planned and coordinated efficiently. In response to this changing of technological environment, the provision of technology education in Turkey is currently undergoing development.

One of the studies held in Turkey in recent years is the study Yildirim (2007) conducted with 402 basic education teachers. He emphasizes that Information and Communication Technology (ICT) plays an important role in the economical growth and social comfort 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.

Besides, over the last three decades, educational technologies and especially computers have been increasingly used at all levels in the teaching and learning process. Recent rapid developments in the areas of computer and communication technology have given rise to further development and changed the nature and practices in education. Educational planners, policy makers and governments are encouraging their citizens not only to be literate in the use of computer technology, but also to embrace these innovations (Driscoll, 1990).

Since computers came into daily life, they have extensively been used by many schools in every branch of education. Computers have a great potential use of delivering instruction to the learner. For this reason, there are various studies about using computer in education. Additionally, there are different terms that are used to describe computer applications in education. These are Computer Assisted Instruction (CAI), Computer Based Instruction (CBI), Computer based Education (CBE), Computer Assisted Learning (CAL) and Computer Managed Instruction (CMI), and so on.

It is worth to note that user acceptance and attitudes to computers are essential factors in the successful implementation of computers. Thompson (1990) defines user acceptance as the mental and neural readiness to the use of computer. The findings of the studies present that it is possible to change the teachers' attitude by persuasive means when the teachers' attitude is determined. Studies emphasized teachers' attitudes towards computer are an important factor to use technology in class (Christiensen, 2002; Hardy, 1998; Wang & Sleeman, 1993). Since, computers getting become a part of our life, schools make concerted efforts in early introduction of functional computer abilities to the students. In this regard, teachers play a momentous role in the smooth achievement of the programs. The success of the program depend upon the attitudes of the teachers and their willingness to embrace the technology. Therefore, it is imperative to address the teachers' attitudes toward using computers, especially for teacher trainees in preparing them to face the challenges of the integrating technology in to classroom (Wang & Sleeman, 1993).

2.2.1. Use of Computers in Classrooms

According to the literature, there are three ways of using the computer in the classroom: learning from computers, learning about computers and learning with computers. Learning from computers includes Computer Assisted Instruction (CAI). In CAI the computers is used to direct the activities toward the acquisition of the knowledge. It was especially popular throughout the 1970s and much of the 1980s, and the most well known form was the drill-practice and tutorials (Jonassen, 2000). Learning about computers can be explained as a computer literacy.

Moreover, Jonassen (2000) defines computer literacy as the skills and knowledge that all citizens need to survive in a society. He also claims that all citizens need computer literacy for handling information and solving problems in a society. When the number of microcomputers is increased in 1980s, educators started to think about how to use microcomputers (Kulik & Kulik, 1991). Educators underlined the necessity and essentiality for learners to learn and use computers. Students were taught about the hardware components and basic skills of computers. Learning with computers supports meaningful learning for students and teachers. They learn with technologies when computers support knowledge construction, exploration and learning by simulating meaningful real word problems, and collaborating with others (Jonassen, 2000).

Studies reported that using computers show many important educational outcomes such as enhancement in student performance, student motivation, teacher satisfaction and so on (Akkoyunlu & Orhan, 2001; Driscoll, 1990; Kulik & Kulik, 1991; Mitchell & Fox, 2001; Morrison & Lowther, 2004; Wang & Sleeman, 1993). When the findings of the studies on computer use are taken into consideration, it is se en that learning is increased via the use of computers. However, the increase in learning can also be due to such aspects as feedback, drill and practice, and self-paced progression. As seen, these aspects are independent of the technology (i.e., they could be incorporated into other non-computer media). For instance, Clark (1994) compares drill-and-practice to computer-based drill-and-practice and points out that both the media (the computer) and the drill-and practice methods affect performance. Though different terms (i.e Computer Assisted Instruction (CAI), Computer Based Technology (CBT) and Information of Learning System (ILS) are proposed, the following assumptions are proposed to improve learning:

a) learners learn more efficiently when they are in control of their pace
b) active involvement leads to more effective learning than passive involvement
c) it is also mentioned that computers have two major advantages and these are:
    a) allow students to progress by themselves b) cognitive load of sorting material

According to Eisenberg and Johnson (1996), students studying with computers exhibit greater task engagement if they use computers in classes and after school. They also stress that computers also support long-term effort.

Thompson conducted a study with teacher educators to find out the effectiveness of students' use of computers. A finding of particular importance to teacher educators was that these students generally agreed that the ability to use computers was a useful skill for living in today's society, and they had positive attitudes toward using computers (Thompson, 1990). Moreover, Becker (2000) reports that if teachers have convenient access, are effectively prepared, have positive beliefs and freedom in the curriculum, then computers are valuable tools in schools.

2.3. Integrating Technology into Education

Technology is now seen as a part of the high quality education by many educators, authorities, teachers, and parents. In order to be able to teach individuals who can reach and use information, teachers should be able to use technology (e.g. computers, internet etc.) effectively and have these skills. Thus, the importance of technology integration in schools rises day by day. However, it is seen that there is not a clear definition for technology integration in the literature. For example, Hew and Brush (2007) state that there is no exact definition of technology integration in K-12 schools. However, from some researches, it is generally understood and examined in terms of types of teachers' computer use in the classrooms. Cuban et al., (2001) explain that if students are only doing basic uses such as searching the internet in schools this is a low-level integration, while students doing multimedia presentations, collecting and interpreting data for projects is a high level integration. Moreover, some scholars examine technology integration in schools as teachers' use to reshape educational activities in class (Hennessy, Ruthven, & Brindley, 2005) or to develop students' thinking skills (Lim, Teo, Wong, Khine, Chai & Divaharan, 2003).

Since technological developments rapidly increase in every field, integration of technology into education is unavoidable. In education process, technology is necessary in order to educate contemporary people. To emphasize the necessity of educational technology, Alkan (1991) writes that it is necessary to utilize educational technologies to provide educational service to masses of people, to serve high quality education, to meet different needs and demands of the society, to use human resources more effectively and to increase equal opportunity in education. Yildirim (2007) also affirms that there seems to be a widespread agreement among researchers, practitioners and policy makers on the field of education that the using technology in classroom improve the learning process in education.

In the twentieth century, we have witnessed major innovation in humankind's activities. Some of these are named such a period as the information age and the space age. The period of the past thirty years is known as the information age resulted from advances in the use of computer technology for collecting, sorting, manipulating, and reporting information. Corporations, government agencies and schools have made significant investments by integrating and expanding their computer-based information systems over the past twenty years in order to take part in the information age (Picciano, 1994).

Cradler (1996) recommends that in order to integrate technology with a curriculum all the stakeholders should be taken into consideration comprehensively. In addition, the following factors should be considered: learners' needs, available recourses, instructional needs and designing curriculum regarding technology, supplying guidance for local staff development and technical assistance.

Melmed (1995) proposes that before the integration of computers into a class, the following issues should be taken into consideration: a) schools should guarantee that the technology holds for student achievement b) factors need to be in place to support the effective use of technology c) resources should use technology plan that will have a positive impact on student achievement

To achieve these aims, educators should take into consideration the findings of the studies on technology, student achievement and contextual factors affecting learning goals. Two main goals can be proposed for the use of computer in schools. One of them is to teach how to use computers and access information on computer. Another goal is to use communication technology effectively in a society. In the light of these goals, Information Technology (IT) and its capabilities (i.e accessing, processing, analyzing information) can be used effectively

In addition, most of today's practicing teachers did not encounter computer-based technologies in their own K- 12 education or in their teacher preparation programs. Therefore, they have not experienced using the computer as a resource from which to learn, nor have they had its use modeled for them in educational settings. Furthermore, because they are not children of the "microcomputer-age," many teachers are fearful of computers and are uncomfortable with the idea of bringing computers into their classrooms (Stevens, 2001). However, Yildirim (2000) concludes that attitudes of the teachers are improved after the computer literacy course. On the other hand, Schware & Jaramillo (1998) emphasized that integration of the information technology into classroom activities should be continuously tested in nations across the world.

Moersh (1995) proposes seven separate implementation levels in his LoTi (Level of Technology Implementation) structure. The computer literacy of teachers varies/changes from Nonuse (Level 0) to Re-finement (Level It is also seen that in the curriculum of instructional technology a series of changes are observed. In other words, the focus of instruction shifts from being teacher-centered to being student-centered. For Moersh, computer technology is a kind of tool that enables students to extend their understanding of the concepts, processes, and themes, which they come across in the use of databases.

Roblyer and Edwards (2005) propose five reasons for teachers to use technology in education: a) motivation, b) instructional abilities, c) teacher higher productivity d) necessary skills for the Information Age, and d) support for new teaching techniques.
In the recent literature about technology integration, although there is a lack of standard definition, the use of computing devices such as desktop computers, laptops, handheld

computers, software, or Internet in K-8 schools for instructional purposes include current discussions about technology integration in schools (O'Dwyer, Russell & Bebell, 2004)

The idea that technology can positively affect student achievement has caused many governments to create projects for the integration of technology in schools. In the United States, for example, school districts reportedly spent $8 billion on technology integration during the 2003–2004 school year (Quality Education Data, 2004). The student-per-instructional computer ratio dropped to 3.8:1 in 2004 and the student-per-Internet-connected computer ratio dropped to 4.1:1 in the United States (Education Week, 2005). The goals of these projects were to allow students and teachers in K-12 schools to use of educational technology effectively in the United States.

2.3.1. Technology Integration in Turkey

In Turkey, the use of information technologies in the education has started after the studies of "Computer Education in Primary Schools Specialism Commission" held by the MoNE in the year of 1984. With the efforts made until the year of 1990, computer buying, developing lesson software and inservice training of teachers for a certain number of general and professional education establishments were made. Important development about the recognition of the Computer Assisted Education occurred between the years of 1990 and 1999. Under the "Developing National Education Project" that was carried out with the support of the World Bank, "Computer Test School (53 BDO) Project' and "Computer Laboratory School (182 BLO) Project" were applied in order to spread computer-supported education and computer education. Besides, great efforts have been spent for determining new goals for the 21st century. Apart from establishing Computer laboratories in schools and spreading computer-assisted education, "Ministry of Education Informatics System (MEBSIS)" Project has been established to help the district and province offices of the MoNE make use of information technologies, initiate automation to them and thus connect them via data net to the central National Education office. By using the tools of information technologies, MEBBIS aims to provide users with cheaper, faster, easier, more in-time and more truthful access to the services of the MoNE (OECD report, 2005).

Moreover, nowadays, MoNE has decided to change the curriculum in elementary education in Turkey. According to the MoNE, it is mandatory to change the curriculum due to the obvious changes and developments taken place in Turkey's demographic structure, parents' qualities, cultural area, human rights, political area, science and technology. Additionally, MoNE has established IT classes almost in all primary schools in 81 provinces in Turkey (MEB, 2004).

In order to provide using new technology in education, spread it and provide teachers and students with the use of information technology material, studies for all included in the education system are being held by the MoNE. Apart from this, ADSL connection project has been established in order to provide fast and continuous internet connection to schools and the computer laboratories in these schools. The Cooperation in Education Project, aims to make education and education environments more effective by integrating information technology material into education and training activities, to establish an education portal where studies held to implement technology into the current education programs and experiences can be shared, and to create an information sharing environment for teachers, students and families. Another program held to implement technology into education is the Basic Education Program, which is supported by the World Bank and aims to establish IT classes in 15.000 schools in rural areas, educate 18.000 IT class coordinators, do inservice training on computer literacy and use computer assisted education (CAL) for 200.000 education staff. With this program, a total of 51.465 computers will be distributed to 26.276 primary schools, ands a printer, scanner, software and power supply (UPS) to each school (OECD report, 2005).

However, some studies concluded that there is no direct relationship between teacher training and access to technology by resulting in increased technology integration into classroom (Ross, Johnson, & Ertmer, 2002) but are brought about by teachers' beliefs about technology and using it in the school. On the other hand, it is needed to enhance dealing with technology by facilitating to preservice teachers in teaching activities. However, according to Brush et al. (2003) research show that teachers do not feel that they are provided with supporting to use technology effectively in their class. Preservice teachers are provided with additional strategies, skills, and experiences in order to integrate technology in to classroom environments.

2.3.2. Transferring Technology into Classroom

It is accepted that the use of technology provides learning opportunities for learners. By the use of technology, students share their ideas and information with other students. On the other hand, Charp (1997) stresses that educators want to access the Internet, need authentic materials supporting curriculum, and require more organization and content evaluation by both subject and grade level. Though educators want to use technology in their classes, they still do not know how to integrate software into their classroom and their students are in demand of the newest programs and applications. Though acceptance of technology in education is increasing and its proper use is recognized as an aid towards educational improvement, its integration into the curriculum is a slow process.

As the use of technology continues, new ways of delivering education must be explored through teaching strategies. When educators apply the use of varied teaching strategies, they believe more in individual learning styles and preferences, and are more apt to engage students in the successful acquisition of knowledge. Charp (1997) presents five learning strategies and their characteristics in technology use. These are as follows:

1) Active Learning Strategies: It focuses on exploration for learners by interacting manipulating and observing the environment. Moreover, students construct their own understandings in this environment.

2) Constructive Learning Strategies: It brings context to learning as students begin from a point of already existing personal experience, knowledge, or interests.

3) Cooperative Learning Strategies; Cooperative (collaborative/group) strategies take advantage of and build upon shared individual knowledge. In this strategies, learners study in groups by interacting to complete their tasks having different responsibilities.

4) Intentional/Reflective Learning Strategies: Reflective learning strategies focus on advantageous for students to build their understandings. Firstly, individuals express their goals. Then, they explain their techniques. Finally, they give details their learning by monitoring their learning.

5) Authentic Learning Strategies: All of the above strategies can be based on authentic tasks that reach beyond text book learning and engage students in the application of knowledge as they participate in real-world tasks.

As seen, the roles of both students and teachers change due to the invasion of technological advances and information. Woodbridge (2003) discusses that technology plays an essential role in the present of education. What is important is planning the use of technology as a strategy for learning (Jacobsen, Clifford & Frieson 2002).

2.4. Factors Affecting Technology Integration in Education

As aforementioned, many educators agree that integrating technology into curriculum plays a major role in providing rich teaching and learning environments. However, putting technology into classroom is only a part of the task. The ultimate goal of integrating technology is that students would use it with the same ease with which they use books, maps, pencil and pens.

According to Brush et al. (2003) in spite of the availability of technologies in schools, a large number of teachers report little or no use of computers for instruction. While many educators and university students use technology in their personal lives in a wide variety of ways, they do not use computers extensively in classrooms. Ertmer et al. (1999) underline that although the number of computers in teachers' classrooms has increased; the integration of technology into classroom is not easily accomplished. In addition, researchers identify many barriers in the integration of technology such as limited equipment, access, time and training as well as teachers preferred instructional methods and their corresponding beliefs about teaching and learning with technology.

Furthermore, Brush et al. (2003) underline that despite technologies accessible in schools, many teachers do not use of computers for their teaching practice. Moreover, researchers have identified many barriers in technology integration, including limited equipment, access, time and training as well as teachers preferred instructional methods and their corresponding beliefs about teaching and learning with technology (Butler & Sellbom, 2002; Cox, Preston & Cox, 1999; Ertmer et al., 1999; Granger, Morbey, Lotherington, Owston, & Wideman, H, 2002; McDermott, & Murray 2000; Medcalf-Davenprot, 1998; Mumtaz, 2000; Pelgrum, 2001)

Specifically, teachers play a significant role in integrating technology into educational programs. The success of integrating technology will depend upon the attitudes of the teachers and their willingness to embrace technology. There is a significant body of literature on the claim that using technology successfully by students in the school depends on teachers' views (Becker, 1994; Christiensen, 2002; Hew & Brush, 2007; Jacobsen et al., 2002; Pierson, 2001; Ross et al., 2001; Yildirim, 2000; 2007). For example, Christensen (2002) stresses that teachers' attitudes toward computers are important while using computers in the classroom.

Mathews, Davis and Hamilton (1996) conclude that one-third of the teachers do not use technology for instructional purposes, whereas half of the teachers define themselves as computer novices. Strickland (1999) demonstrates that while more than 92% of the teachers had a computer system in their classrooms, only 15 % of the teachers reported integrating it into curriculum for instructional purposes. Medcalf-Davenport (1998) points out that that the computer technology is still viewed as one of the components of the curriculum (i.e., teaching about how to use it) rather than as a tool for teaching the curriculum to students (using the computer as an integrated tool).

According to Becker (1994), there might be variety of factors that contribute to the technology integration, when using technology in teaching activities. According to Becta (2004), for example, besides the teacher factors, there are also school aspects which might reduce use of technology. There is need to conduct more research including both teacher level and school level factors to enlarge use of technology in schools.

Moreover, Pelgrum (2001), who collected data from representative samples of schools from 26 countries, indicates that there are ten major barriers related to the integration of technology in schools. These major obstacles are as follows:

- inadequate number of computers
- Teachers' incompetencies
- Difficulties integrating technology in to teaching
- Complexity of the arrangement computer time
- Insufficient hardware
- Not enough copies of software
- Not enough teacher time
- Inadequate simultaneous access
- Not enough supervision staff
- Lack of technical assistance

The taking away of these barriers can be achieved by introducing teachers to the types of technology use that can support their immediate needs (Ertmer, 1999). At the very least, this can increase their confidence for using technology so that, over time, higher-level uses become more plausible.

On the other hand, Ertmer (1999) classifies the barriers as first order barriers including limited equipment, training and support, and second order barriers which are internal barriers including teachers' own deeply held beliefs about teacher-student roles, curricular emphases and assessment practices. She also gives some advices to overcome these barriers. According to her suggestions, professional development should be directed including greater emphasis on professional growth. She claims that learning to use new technology tools change classroom practices for most teachers. If teachers use appropriate types of technologies according to their needs, this increase their belief in using technology effectively in classroom activities.

According to another study of Ertmer (2005), the rate technology usage is surprisingly low although situations like accessing technology in schools in order to provide a successful technology integration, ameliorating the education for teachers, adjustment of necessary political organizations have been constituted. As a reason for this, Ertmer emphasizes that although there are many barriers affecting technology usage, pedagogical beliefs of teachers to technology play a vital role.

Parallel to the new learning pedagogy, Yildirim (2007) emphasizes that teachers play a more vital role in the teaching and learning process today compared to the past. Teachers undertake the most important role in introducing novelties to the education system. Thus, their attitude to technology and novelties shape the technology adjustments in their preferred schools and effective usage. Yildirim (2007) recently has conducted a study with 402 basic education teachers about teacher's current use of Information and Communication Technology (ICT) in the Turkish basic education schools and the barriers of effective technology integration. He concludes that although teachers have been usually held responsible for the success or failure of ICT in schools, there are indeed several barriers for the diffusion of ICT. According to his study results, teachers largely used ICT for creating handouts and tests, rather than using it to promote students' higher order cognitive abilities. Due to the lack of pedagogical and inservice support, teachers reported the lowest frequency for the use of instructional software. For Yildirim, an access to technology is another key factor in the effective technology integration process. Moreover, the use of ICT, for him, is only effective if every student in the class is assigned to instructional activities with sufficient number of computers. Otherwise, computer lab sessions would only waste time for teachers and students as well. He also stresses that lack of principal support, lack of collaboration among teachers and inflexible curricula are also negative factors to integrate technology into the curriculum.

2.5. Training of Computer Teachers

2.5.1. Teacher Training System in Turkey

From the establishment of the Republic to the year 1982, teacher training in Turkey was conducted in teacher training schools and village institutes—both of which were educational institutions at the secondary level—in education institutes and teacher training colleges with 2-3 years programs at the tertiary level, and in relevant departments of universities.

Since the establishment of the Republic and until the year of 1982, the teachers in Turkey have been trained in secondary school level teacher schools and village institutes along with higher education level 2-3 year education institutes, high teacher schools and related departments of universities. With the number 2547, Higher Education Law put in practice in 1982, all higher education associations were brought together under Presidency of HEC, which changed structure, status, and progress of the teacher training system in Turkey. With this law, teacher training associations were re-structured under the names of education faculties and education colleges (OECD Report, 2005)

The programs of the teacher training departments for primary schools are also prepared by the HEC. When these programs are explored, it is seen that the total class credits of the departments range between 140-160 credits, which include 30 credits of teacher formation classes for those graduated from the departments of preschool education and primary education, and 36 for those graduated from other departments, and 11 credits for teaching practice.

With the "Act of Teaching Practice for Teacher Candidates who will serve in schools under the MoNE", prospective teachers who are studying at higher education schools have been given the chance to practice teaching in the schools of the ministry. In this regard, the 11 credits teaching practice courses carried out in the teacher formation programs, which include 2-semester observation and one-semester teaching practice, help teacher candidates get prepared for the profession as required and understand the basic characteristics, realities, and the difficulties aspects of the teaching profession.

2.5.2. Inservice Training

Regarding inservice training activities, the MoNE provides education to teachers and other staff on the subjects of candidacy, consistency, information refreshment, development and preparation to higher positions. While the inservice training of the staff had been planned and applied until 1993, after this date authorization was given to governorships to plan and apply in their own cities inservice training to the staff on duty (administrator, teacher, civil servant, technical staff, etc.).

Inservice training courses were organized by MoNE in order to spread computer and other technology-supported educational applications and make use of computers in the fields of education-training and administration services, and interaction webs were established between the central and suburban organization and educational associations. A total of 16.257 staff benefited from the 329 inservice training courses held in 2002. Approximately 300 teachers were accepted into the inservice training programs organized with the cooperation of the MoNE and various universities trained 'formator teachers' on the subject of computer assisted education between the years of 1991 and 1997, which improved the teacher training programs in this period (OECD Report, 2005). Moreover, in this report issued by the MoNE, it is stated that the quality and accessibility of education are further increased in the following projects:

- Basic Education Project Phase II,
- Project for Supporting the Basic Education,
- Project for Enhancing the Vocational Training System,
- Project for Development of Vocational and Technical Education and
- Project for Secondary School Education. (OECD report, 2005)

2.5.3. Computer Teacher Training

HEC redesigned the curricula of schools of education in 1998 in Turkey. According to the council, preparation for the teaching involves the gaining of knowledge and skills in three domains. These domains are special subject matter domain, pedagogical domain and general cultural domain. In computer education, like other teacher education programs, 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. Furthermore, the teaching practicum takes place in three sessions throughout the teacher training program. One is school experience during the second semester of the first year, and the other two take place in the first and second semesters of the fourth year.

Moreover, departments of the Computer Education and Instructional Technologies (CEIT) have been established in order to educate computer teachers for primary schools (YOK, 1998). These departments, established within the education faculties of various universities, enrolled their first students in the 1998-1999 academic year and gave their first graduates in the 2001-2002 academic year (Orhan & Akkoyunlu, 2003). Computer teachers who are graduated from these departments are employed by both MoNE and private schools.

When prospective computer teachers finish their university education, they become competent both in subject matter and pedagogic domain. According to Geddis and Wood (1997), knowledge transformations depend upon teachers' capacity to recognize and manage dilemmas in the practical context. Since they will be computer teachers in schools and one of their most important roles will be to integrate technology (especially computer technology) into their lessons, they must be competent both in subject matter and in pedagogic domain before becoming teachers. Brush et al. (2003) also stress that planning and preparation are major themes for incorporating technology into education. One of the most related results concerning teaching is that effective teachers maintain a balance between specific strategies designed to manage student behavior in the classroom and instructional strategies (Gilberts & Craft, 1997

2.5.4. Computer Teacher Training in the World

In the literature, there is lack of studies that conducted to investigate about computer teaching or the role of the computer teachers. It is seen that the title or the roles of the teachers who are mainly responsible for integrating technology varies from the country to country such as computer coordinators, technology coordinators and media specialists (Law & Plomp, 2003). Moreover, the terms such as computer literacy, ICT literacy and IT literacy are used interchangeably.

Regarding to the use of computers, when it is included in the curriculum, there are two main ways: a) they are taught as a separate course and 2) they are used as a helping tool in the projects (EURYDICE, 2001). In many European countries in the 1990s, computers had been taught as a school subject in a separate courses mostly named computer literacy in education, at the secondary level (Baste, 2003; Pedersen, 2003, Kington & Harris; 2003; Reignier, 2003). On the other hand, these days the focal point in the technology integration has shifted from learning about ICT to learning through to ICT. For example, the main concern is to teach using the internet or educational software in students' assignments inside and outside the schools.

Moreover, in developed countries such as western European countries and the USA, ICT competencies are taught in classes as a part of other subjects (Anderson & Dexter, 2003; Zander, 2003). In practice, for example, teachers of several non-computer subjects embed ICT in their teaching activities. On the other hand, there are a few countries, England, to continue teaching ICT skills as a separate course (Law & Plomp 2003). Although, schools are free to teach ICT as a part of the course, Kington & Harris observed that in England, teachers insert ICT in other subjects such as mathematics, science, and English classes. Law & Plomp (2003) also claim that students in schools acquired ICT skills in varied ways such as using these technologies in their learning activities.

According to Law & Plomp (2003), when ICT is taught in a separate course as a subject, teachers who are expertise in computing are needed. In that case, such related courses as programming, networking and developing software are needed to teach students. In some countries such as in Greece and Bulgaria (EURYDICE, 2001), these implementations occur especially in vocational schools. On the other hand, if ICT is used in the basic education curriculum, it is unavoidable that all teachers are affected. Teachers also need to have some basic skills about the use of ICT.

The growing need to integrate of ICT in schools and various ways to use it engender to the new roles for all stakeholders in educational area. Law and Plomp (2003) claim that school or class teachers are not be able to achieve these new roles and tasks by themselves. In some developed countries schools hired computer-related person to provide technical or instructional supports. In the USA for example, many schools have a computer or technology supervisor. These staffs also play an active role in integrating technology (Anderson & Dexter, 2003). In France, government decided that all schools have computer coordinators who help teachers to integrate technology in their teaching practices (Reigner, 2003). They also teach ICT as a separate subject at secondary level. These teachers are trained about technology (not just ICT) in university (EURYDICE, 2001). According to Law and Plomb (2003), the roles of the teachers who are responsible for integrating technology are different from countries to countries in the different practices.

Regarding to ICT teacher training, based on the literature review, it is seen that there is no clear standards in ICT teacher training. Davis, Preston and Sahin (2008) supported that since ICT teacher training are different in each culture, research about comparing the effectiveness of ICT teacher training are rare. According to the report of the EURYDICE (2001) which gives information about indicators on the ICT integration in to European education system teachers who serve as ICT specialists receive special training. For example, in Belgium, ICT specialists take courses about ICT in universities, after completed their basic training. In Luxemburg, computer science engineers and university staff give ICT courses in secondary education. In France, university trained teachers give lessons about ICT in secondary education. On the other hand, mathematics teachers give courses about ICT in Malta. Moreover, in the Netherlands, primary and secondary school teachers receive one-year special ICT training after their basic training. After completing their ICT trainings, they serve in the school as an ICT coordinators. In Austria on the other hand, duration of the ICT specialist training changes from 1/2 to 2 years (EURYDICE, 2001). Moreover, in England although primary teachers are trained to teach all subjects including ICT (EURYDICE, 2001), there is an ICT coordinators who receive special trainings. These ICT coordinators are responsible for supporting teachers and students to use technology in teaching and learning activities (Lai & Pratt, 2004). Furthermore, although in European countries, basic education preservice teachers take ICT related courses during their training (Eurydice, 2001), a full-time coordinators is necessary to integrate technology successfully in to curriculum (Lai & Pratt, 2004).

2.6. Teachers' Professional Growth

It is accepted in the studies conducted in the subject of education that the most important and basic elements of the school systems are the students, curriculum and teacher. It is emphasized that without one of these there would not be education or schools (Sönmez, 2003). Likewise, the facilities, class, tools, and equipment, educational and industrial training programs designed to meet the basic needs of the students make up the programs' needs. However, an effective teacher is of major importance for a dynamic and successful training program. Teacher is the key variable of the effective education program at all levels and environments (Miller & Miller, 2002).

The general expectations from a teacher who is accepted as the key variable of education are:

- taking into consideration of the individual differences
- supporting all students and groups in the classroom to participate in the activities,
- encouraging group work,
- planning teaching strategies,
- using suitable and different methods and techniques,
- evaluating the students with appropriate method and tools,
- preparing teaching materials,
- using appropriate technologies,
- directing students to correct behavior, and
- teaching students to reach information (Çeliköz, 2000).

It is clearly seen that to meet these expectations, the teacher must be well trained, and posses competencies that are thought to be directly effective on student success. All the things aforementioned are also valid for computer teacher training programs.

When preservice teachers satisfactorily complete their coursework at the university and complete their teaching practices, it is assumed that they become ready to enter the field of teaching. However, according to Parker (1998), some teachers who are in their first years of teaching suffer burnout, disillusionment, and dissatisfaction with their profession. Others do a good job, feel effective and remain content with their choice of career. Reasons for these inconsistencies may be explained by the personal attributes of the teachers, situational job factors and inadequacies of teacher education programs (Corcoran, 1981; McDiarmid 1990). As Veenman (1984) underlines, although teaching is a complex and demanding profession, quick transferring from training to practice leads to problems for beginning teachers. Likewise, Tabachnick and Zeichner's study (1980) reveals that there is a conflict in the college education and the reality of the classroom. Therefore, preservice teachers' professional growth during their professional careers is of vital importance. Preservice teachers' professional growth has been studied in the literature by some researchers (Calderhead, 1993; Carter, 1994; Clarke & Hollingsworth, 2002; Grossman, 1992; Kagan, 1992; Marland, 1993; Richardson, 1990; Ross & Bruce, 2007; Zeichner & Gore, 1990;). In the related literature, professional growth is defined as changes of the behavior, knowledge, images, beliefs, or perceptions of teachers. These studies reveal common sequences of change and processes in teachers' professional growth. Regarding the stages and teaching practices which are invaluable to teacher educators who could use them to infer the nature of teacher, education programs most likely promote professional growth. Such information provides an empirical basis for the design of programs (Eisenhart, Behm, & Romagnano, 1991; Lampert, 1988).

Teacher educators and authorities have conducted a number of studies for teacher development; these models generally have been constructed

- to adapt theories of general cognitive development to teaching;
- to attempt justifying classroom practices in developmental terms;
- to infer a theory from a single agenda for empirical research (Burden, 1990).

On the other hand, professional growth among novice and beginning teachers is both behavioral and conceptual. Kagan (1992) explains that professional growth consists of at least five components, which are:

1) Preservice teachers become aware of their own knowledge and believe about pupils and classroom environments and how their knowledge and beliefs are changing.
2) They modify, adapt and reconstruct their images as teachers.
3) Their attention shifts from self to the design of instruction to pupil learning.
4) They develop standardized routines that integrate instruction and management and grow increasingly.
5) Their thinking upon classroom problem solving grows. Finally, their repertoires can be developed across the years.

Kagan (1992) brings a further understanding of professional growth by reviewing 40 studies conducted on teachers' professional growth. 27 of these studies deal with preservice teachers and 13 with first year or beginning teachers. Each study is deeply examined in Kagan's study in order to understand the changes in personal beliefs or in the ways personal belief images affected what novices learn from university course work. She reviews these studies in order to construct a model of professional growth for preservice and beginning teachers and to draw inferences from the model concerning the nature of preservice teacher education. She clusters and summarizes according to the major themes drawn from the findings of these studies. According to the results of these analyses, preservice and first year teaching appear to constitute a single developmental stage with three primary tasks:

1) Obtaining knowledge about pupils
2) Modifying and reconstructing their personal images of self as teacher;
3) Developing practices which incorporate classroom organization and instruction.

Besides these, Kagan reports that university classes fail to provide preservice teachers with adequate procedural knowledge of classrooms, knowledge of pupils or a realistic view of teaching in its full classroom school environment. In a way contributing to Kagan's findings, Bullough (1990) supports that the problem of finding oneself as a teacher about establishing a professional identity is conspicuously missing from most lists of beginning teachers' programs.

Kagan (1992) suggests that a new model of the preservice teachers' progresses should include:

Procedural knowledge: Preservice programs should provide procedural knowledge for preservice teachers and encourage the acquisition of standardized routines which include integration of classroom management and instruction.

The relevance of self-reflection: The necessary and appropriate focus of preservice teachers' attention and reflection depends on their own behaviors, beliefs, and image of self as teacher. Instead of expecting novices to reflect on the moral and ethical implications of classroom practices, teacher educators assist them to examine their prior experiences in classrooms and their tendencies to assume that other learners share their own problems.

Extended interaction with pupils: As preservice teachers are making their images and beliefs clear, they also need to acquire knowledge about pupils' aptitudes, interests and problems. It appears that this can only be accomplished through extended teaching practice. It is clearly seen that the two to four limited kinds of practice entailed in most contemporary programs are not sufficient. They may also need structured extra practice that may allow novices to step back from their own beliefs and images long enough to perceive the reality of pupils and classrooms. Therefore, they modify and reconstruct the images about teaching. The image of teaching must also be constructed according to the realities of teaching.

Cognitive dissonance: Student teachers want to understand the benefits that may accrue from immediate discomfort; cooperating teachers need to be prepared to discuss opposing beliefs.

Obsession with class control: Before they establish standard routines and determine their images of self as teacher, teachers will be obsessed with discipline and class control. Supervisors should help to develop teachers' views.

Developmental readiness: Some preservice teachers may not be developmentally prepared to acknowledge dysfunctional aspects of their images of self as teacher. Teacher educators should guide them to help their professional growth.

The relevance of theory: Expert teachers build contextual and highly personal theories from their own experiences. Therefore, formal theory should be relevant to teachers and their teaching experiences at any point in their professional development.

According to the study which was conducted by Clarke and Hollingsworth (2002), the process of learning is inevitably an ongoing one. They define professional growth as the process by which both inservice and preservice teachers grow professionally. Moreover, they argue that the pedagogy of teachers is the theories and practices developed by teachers at the heart of their professional growth. Based on their opinion, the interconnected model of professional growth makes teacher change a learning process that suggests the possible mechanisms by which this learning might occur. Furthermore, they put forth that the process of teacher growth must offer teachers every opportunity to learn the approach that each teacher finds most useful.

On the other hand, Keller, Ehman and Bonk (2002) underline that scholars who offer a new vision of professional development in education, suggest a progressive vision of the teaching.

As seen, the changes preservice and inservice teachers undergo in terms of their views and performances is a controversial issue among researchers Though many attempts are made to change what teachers do in their classrooms (i.e. teacher practice, activities etc.), it is observed that such attempts are in vain (Richardson, 2003). Ross and Bruce (2007) present that the change of teacher is related to the self-assessment of their professional growth. They add that self-assessment tool contributed to teacher professional growth consists of the following criteria:

a) influencing quality of teaching
b) supporting the teachers to improve goals
c) assisting with the teacher's peer
d) increasing the influence of the teaching practice.

Clarke and Hollingsworth (1994) portray six perspectives about teacher change in terms of their professional growth:

- Change as training
- Change as adaptation
- Change as personal development
- Change as local reform
- Change as systemic restructuring
- Change as growth of learning

Clarke and Hollingsworth (1994) suggest that the central focus of current professional development efforts most closely aligns with the change as growth learning perspective. Within this perspective, they identified change as learning, which is regarded as a natural and expected component of the professional activity of teachers and schools.

According to Ross's (2001) study about professional growth of teaching, teachers must keep up with modify and become accustomed to it, meet the goals of group members, and expand to meet the needs of existing members while integrating with new members. Furthermore, they should be developing, forgiving, and accommodating; focusing on both individual and organizational development; cooperating with the members of the group for leadership and expertise; involving all collaborates in finding and solving problems.

Additionally, the belief in continuing and lifetime professional growth and learning for teachers emphasized by several authors in the literature (Fullan & Stiegelbauer, 1991; Lemlech ,1995; Schon, 1987). Models of the process of (especially preservice) teachers' change or growth have been progressively refined over the last couple of decades (Clarke & Hollingsworth 2002). For example, according to Guskey (1986), teachers' classroom practices positively change after significant changes in beliefs and attitudes. Changing teachers' practices also leads to transform in students' learning. Guskey (1986) presents a view of change and provides a model for that. He states that changes in beliefs are likely to have effect after changes in student learning outcomes are evident.

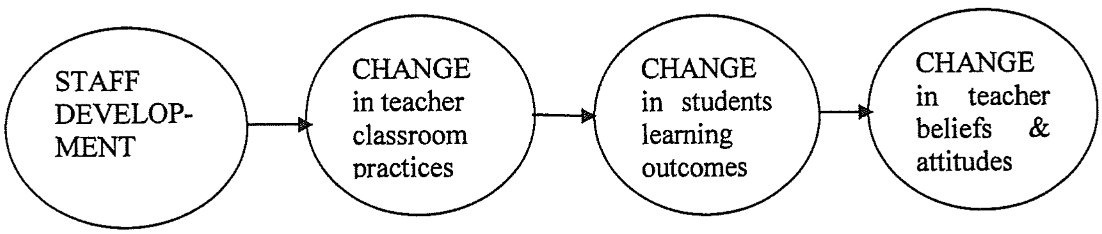

Figure 2.1 Guskey's model of the process of teacher change (Guskey, 1986).

2.6.1. Perception of Teaching

According to Ashcraft (2002), perception is a process of interpreting and understanding information. As individuals adapt to their environment, they extract certain information about the environment through their metacognition (Ashcraft, 2002). For Beijaard et al. (2000), teachers' perceptions about their profession affect their efficiency, motivation, and progress. Teachers' thoughts about teaching are important factors in the school environment for meeting schools' missions and visions, since students' achievement and attitudes toward school are dependent on teachers' practices. About preservice teacher perceptions, Wilson and Cameron (1996) study that they start training programs with clear perceptions about teaching. Indeed, supported by many scholars, student teachers feel that successful teachers promote the personal, psychological and social growth of their students (Brookhart & Freeman, 1992; Mahlios & Maxson, 1995; Weinstein, 1989, 1990). For preservice teachers, effective teacher attributes include strong relationships with students, including friendliness, warmth, concern, the capacity to communicate well, and patience (Weinstein, 1989). These studies also indicate that perceptions of effective teaching change throughout their years of preparation. For instance, in their comparative study, Mcdermott, Gormley, Rothenberg and Hammer (1995) found that student teachers move from a perspective emphasizing student learning to classroom management as they progress in their preservice education. This situation is also valid for the professional growth of the preservice teachers.

Some studies attempts to examine teachers' beliefs and perceptions also in the teacher education literature. Some have considered teachers' beliefs (Song, Hannafin & Hill, 2007). Others considered on teachers' perceptions of the effective teaching (e.g., Wilson & Cameron, 1996). Some have attempted to outline the differences in perceptions at different stages of teacher education programs (McCullough & Mintz, 1992; McDermott et al., 1995). Others have compared preservice and inservice teachers' perceptions. In their qualitative research, Kagan and Tippins (1992) found that there were differences between preservice and inservice teachers in term of perceptions. For example, they found that inservice teachers were more student-focused than preservice teachers were. In a recent study, Saban (2003) argues that while there are studies dealing with preservice teachers' reasons for teaching and attitudes about teaching as a profession, further investigation is needed to illuminate the similarities and differences in the views prospective teachers bring with them as they enter teacher education programs in different socio-cultural contexts.

Moreover, in the literature, teachers' perceptions are positively correlated with characteristics of teachers. For example, Koca and Sen (2006) affirm that researchers have examined preservice teachers' perceptions about the characteristics of good teachers. Some of them have used questionnaires (e.g., Maxson & Mahlios, 1994; Minor Onwuegbuzie & Witcher., 2000; Weinstein, 1989, 1990; Witcher, Onwuegbuzie & Minor, 2001), while others have employed interviews with student teachers or teachers to understand their perceptions (Holt-Reynolds, 1992; Weinstein, 1990). Weinstein also (1990) used both quantitative and qualitative methods to examine preservice teachers' perceptions. According to Weinstein study, although the perceptions of teacher candidates on the profession of teaching decreases as time goes by, the optimism continues in future teaching.

There are bodies of literature in which teachers' beliefs and perceptions about teaching and learning their subject area significantly influence their performance in the classroom as well as their students' outcomes (Fajet, Bello, Leftwich, Mesler & Shaver, 2005; Holt-Reynolds, 1992; Koca & Sen, 2006; Pajares, 1992; Prawat, 1992; Stipek, Givvin, Salmon, MacGyvers, 2001). For example, Pajares (1992) emphasizes that teachers' perceptions become an important point for educational environment. He also underlines that these perceptions can even affect the practices of beginning teachers.

Calderhead and Robson (1991) conducted a research with 12 preservice teachers about their perceptions of teaching in their first year in an elementary teacher training program at a British university. They concluded that each of the 12 novices entered the program with clear images of good teaching that were related to their own classroom experiences as pupils.

Likewise, McDaniel (1991) observed preservice teachers' perceptions of basic courses in philosophy and the history of education. Findings indicated that perceptions were not affected by both the content of the course and the field observations.

Minor et al. (2000) collected data from 134 preservice teachers. According to the results of the study, there are seven perception categories of effective teachers. These categories are as follows: student-centered environment, effective classroom manager, competent instructor, ethical issues, enthusiastic about teaching, knowledgeable about subject, and personable. They also found that more males than females approved teacher characteristics as behavior manager and of creating an effective classroom.

Peretz, Mendelson & Kron (2003) state that teachers' perceptions of their professional roles are closely related to their views of themselves as professionals and their impact on the learning of their students. They examined 60 teachers' perceptions of teaching and found out that the environment of the teaching has an effect on teachers' views in terms of their professional growth.

Similarly, Ghaith & Shaaban (1999) indicate that high personal efficacy teachers are more confident about meeting their students' individual learning needs and motivating them to learn. They also highlighted that teachers with low personal sense of efficacy are more probable to blame themselves for poor student outcomes. Moreover, they suggest that teacher trainers and staff developers have to arrange intervention programs for both preservice and inservice teachers to enhance their professional efficacy. These programs focus on increasing their content knowledge and pedagogical skills, so that their personal views about teaching can be ameliorated. They also emphasize that teachers' self efficacy and perceptions of teaching are directly linked with professional growth.

Young (1995) conducted a study with 272 preservice teachers, who entered a highly selective teacher training program, to examine their reasons for entry, work perceptions, and their future career plans. The study concluded that these brilliant students entered the profession mainly for intrinsic reasons and had realistic views of working conditions. On the other hand, many of the participants planned to remain in the profession only if they obtain the expected satisfaction from working. She also emphasizes that teachers' successes in schools are depended on their perceptions. Therefore, continuing support must be provided to especially beginning teachers, since novice teachers, especially those who have the most attractive alternatives in the job market, may not carry on the teaching profession if they experience failure in the classroom.

When looked into the researches related to the teaching profession in Turkey, it is observed that these studies show differences from each other. For example, it is seen that some of the studies are related to the perception of the profession, some to the teaching process or teacher behaviors in class. It is seen that these researches are generally conducted about teacher opinion. Teacher behaviors are generally measured with surveys developed by researchers. Indeed, interview and observation schedules are used (Üredi, 2006).

A research conducted by Şişman and Acat, for example (2003), examines whether preservice teachers' perceptions of the teaching profession change after application activities in schools, and whether there are any differences in the perception of the profession of preservice and inservice at schools and in experiences. Based on the results of the research, the perceptions of social status of preservice teachers and their subject knowledge perceptions develop in a positive way. However, preservice teachers' perceptions of their own teaching formation have not changed before and after the application. It is revealed that the more experienced the teachers in the profession are, the more negatively their perception of the social status change. Moreover, teachers and teacher candidates' perceptions of the ethic values of the teaching profession change according to the professional experiences. As the experiences increases, the level of accepting the ethic values of the profession increases, too.

Another research conducted by Acat, Balbağ, Demir & Görgülü (2003) analyzes the professional perceptions of the graduates of faculties of art and sciences who want to become teachers and thus attend a graduate program without thesis writing in faculties of education. The research has been conducted among a total of 333 teacher candidates, 195 of whom are from Osmangazi University faculty of art and science, 62 from the faculty of education, 34 from the social sciences institute and 42 from the science institute. Results show that the perceptions of a preservice teachers' social status of the faculty of education, faculty of art and science and graduate students without thesis are considerably high. Apart from this, while having intermediate level positive perceptions related to the social aspect of the inservice teachers, preservice teachers have high perceptions about pedagogical formation, ethic values and their own competencies. In the analyses made related to the differences of department, there is a more positive perception in departments where there is a higher chance of being appointed by the Ministry of Education as a teacher. This situation demonstrates differences between departments where the chance of being appointed is lower. In this respect, results show that CEIT students have the highest positive perception, whereas Biology students have the lowest positive perception.

Ültanır (1998) studies whether inservice and preservice classroom teachers' perceptions of the teaching profession and classroom teachers' perception about their profession show differences related to gender. The research was conducted among 85 female and 55 male teachers (a total of 140) serving as 1st level classroom teachers or administrators in the primary schools in the district of Bolu City Center, and 179 67 female and 112 male teachers (a total of 179) fourth grade preservice teachers in the department of classroom teaching at Abant Izzet Baysal University. Results indicate that there is a significant difference in favor of classroom teachers on the subjects of performing the profession willingly, being patient, smiling, and being able to solve the educational and individual problems of the students. Apart from this, there is not a significant difference between genders about occupational duty perceptions.

In another study conducted by Kayabaşı (1998), teachers who are serving in primary and intermediate level schools, the degree teachers show their behaviors have been evaluated in terms of student points of views. Apart from this, an effort has been made in order to research according to student point of view whether the school type from which the student has graduated, the lesson type (numerical-verbal) and the school type where the teacher serves are effective. The research about the level of demonstrating in class teaching behaviors was administered with 187 primary and intermediate level school teachers in primary and public schools. The findings have been determined by applying an observation form consisting of 20 items. According to the research results, teachers who have participated in the research demonstrated their teaching behaviors in an important level (65%). Moreover, 4-year graduate teachers demonstrating their teaching behaviors are more successful than 2-year degree teachers. Besides, teachers giving verbal lessons are more successful in demonstrating their teaching behaviors than teachers who do not give numerical lessons. Moreover, the results show that the type of school served for is not effective in demonstrating teacher behavior.

Detailing further the literature on the issue, Okçabol (1998) conducted a study about the characteristics of teachers and determined the general characteristics of teachers, the way they evaluate their professions, the education system and the social problems, and what their expectations are on educational subjects. From the data gathered from 2301 teachers and administrators at 205 schools, results are were obtained related to teacher training. These results are; 52.4% of teachers chose this profession because they saw it as an ideal occupation, the rest chose this profession by chance and on compulsory conditions. Most of the teachers read newspapers on their free time, the rest did a second job, participated in cultural activities, and went to local gatherings. Teachers could not establish a sufficient amount of relationship with students and found themselves insufficient in their professions. Their teaching was mostly based on affective knowledge because, they thought, course books do not possess sufficient qualities. Moreover, teachers explained that education is not democratically, there is not an equality of chances. In addition to these, there are major neglects in training teachers.

Another study on the issue has come from Üredi (2006), who investigates the perceptions of teaching profession according to the choice of teaching styles of primary school 1st and 2nd level teachers. Üredi obtained findings from 1306 teachers working at 49 primary schools within the city of İstanbul. According to the results of the study, there is a significant difference ($p<.01$) in favor of females between male and female teachers and in the sub-factors regarding the perceptions of the teaching profession. Moreover, there is a significant difference ($p<.01$) in terms of subject knowledge, pedagogical knowledge and general professional perceptions according to the type of schools teachers work at. Apart from this, the research results show a difference ($p<.01$) between perceptions of the teaching profession in terms of the teachers age, branches, experiences and the last school they have graduated from.

2.6.2. Teacher Competencies

It is essential for teachers to become more knowledgeable about teaching and develop a repertoire of teaching strategies. Therefore, it requires supporting them to empower teaching in classroom (Firestone, 1991; Maeroff, 1998; Short 1992). Furthermore, Short (1992) underlines the features of the teacher empowerment that is defined as a process in the competence of teachers' professional growth. These dimensions are as follows:

- involvement in crucial decisions
- force as an indicator of influencing school life
- status concerning professional respect from colleagues
- controlling of their professional days
- Professional development opportunities
- The perception of teaching

She also states that these dimensions refer to teachers' professional growth and affect their competencies through their work life.

In the studies in the literature on professional competencies, good teachers generally, are thought to have sufficient knowledge of the content area in which they teach (Minor et al., 2000; Reed & Bergemann, 1992; Skamp, 1995; Weinstein, 1989). Researchers have clearly highlighted that good teachers undoubtedly transfer their knowledge to their students (Reed & Bergemann, 1992; Segall & Wilson, 1998; Skamp, 1995).

The main components of the teaching profession have been defined under three dimensions. These are general knowledge, subject matter knowledge and pedagogical knowledge.

General knowledge: The general knowledge is a dimension that helps the teacher while performing his/her professional roles and making these more effective. It is also a dimension consisting the experience and competency between the disciplines of the education period. According to this point of view; apart from not carrying an independent competency area characteristic, the context of general knowledge is very wide and variable

Specific subject matter (Content) Knowledge: Content knowledge can be defined in the literature as knowledge about the subject matter to be taught (Ball & McDiarmid, 1990; Mishra & Koehler, 2006). Besides, Mishra and Koehler (2006) assert that the content in schools is varied from courses to courses. Parallel to this view, special content area has been determined as the competency dimension consisting of the knowledge, skill, attitude, behavior and habits that the teacher is responsible for teaching. Special areas in teaching are pre-school, classroom teaching, Turkish, Mathematics, science, social sciences, physics, chemistry, art and craft, electricity, computer, ready clothing, special education and similar areas.

Pedagogical Knowledge: In the literature, researchers define the pedagogical knowledge as the processes and practices of teaching involved in lesson plan, classroom management, and student assessment. It also includes knowledge about methods to be used in the classroom (Mishra & Koehler, 2006).

Regarding teachers' competencies about their knowledge, the competencies in educational processes have been defined as the teacher's knowledge, skill and attitude to a certain special area and teaching these to others or creating the suitable chance and possibilities for these to be learnt. The most important part of the pedagogical competency is knowledge, skill and the attitudes of teaching these to other pupils. However, different qualities are also expected from the teacher apart from the teaching training activities in class. These are; in class and in school guiding, serving students who require special education and developing the school. Qualities will establish the basis of an important cooperation with the education experts who are guiding teachers and students while contributing to the increasing of education quality. Furthermore, Shulman (1987) emphasizes that teachers should know the subjects which they teach.

In Turkey, according to the HEC, preparation for the teaching involves three domains. These domains are special subject matter domain, pedagogical domain and general cultural domain. In computer education, like other teacher education programs, 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. Furthermore, the teaching practicum takes in three sessions throughout the 4-year teacher education program. The first one is school experience during the second semester of the first year, and the other two take place in the first and second semesters of the fourth year. Moreover, MoNE has decided to change the curriculum in elementary education in Turkey nowadays. According to the commission that prepared the curriculum, the new curriculum generally is based on "constructivist approach", because in this new curriculum learning and teaching processes is student-centered, individual differences is important, cooperative and active learning strategies are important for learning, the students' problem solving skills are developed, and so on (MEB Komisyon, 2004). Moreover, in this new program, teachers' role is to facilitate learning by guiding students during the learning process. Instead of direct instruction, teachers will use various activities in order to help students' learning by making them participate in problem solving and decision making processes.

While defining the teaching profession, in Turkey the 43rd item of 1739 numbered main law of national education also emphasizes that teachers need general knowledge, subject knowledge and subject matter knowledge, and points at the required competencies for teachers (Çeliköz, 2000). Parallel to this, researchers define teaching as an expertise profession that requires special training (Çeliköz, 2000, Sünbül, 2001). Similarly, Çeliköz (2000) emphasizes that every teacher is expected to be an expert on the subject matter. According to him, in order for a teacher to be successful in the profession, s/he first needs to have good knowledge of his/her own subject area. That is why subject knowledge plays an important part in teacher competencies and carries an importance of 60% in the teacher training system. It is clearly seen that in Turkey teacher training programs are dominated with the subject knowledge on the field and the pedagogical knowledge. Generally, the content and the number of the courses the teacher candidates take are greater than they need to learn and greater than the number of pedagogic courses regarding the way of teaching of that specific field of expertise. The number and the content of general training courses may vary from one university to another and be different among departments (Koca and Sen, 2006).

According to Tan and Erdoğan (2004), the teacher must know his/her subject area very well and must possess a sufficient amount of knowledge, skill and positive attitude about teaching and training. The reason for this is that it is not likely to make up for the subject area related knowledge and skills with other knowledge and skills.

Ünal and Ada (1999) also highlight that preparation for the teaching profession is secured by general knowledge, special subject knowledge and pedagogical formation. The studies made about teacher qualities take the following three dimensions as basis: teacher effectiveness, teacher competency and teacher professional performance. In these studies, teacher competencies have been accepted as the level of the teacher possessing the required knowledge and skill (competency) in order to realize teaching effectiveness (Dunkin, 1997). Likewise, Korthagen (2004) considers teacher competency as a consistency whole that is made up of knowledge, skill and attitudes. Therefore, he confirms that the basis of the teacher behavior is made up by teacher competency.

It is important that a teacher should have subject knowledge and related skills, but this is not enough on its own. Teachers having a high degree on technical skill and subject knowledge may not be counted as effective in terms of the teaching role. The teaching role of the teacher requires knowledge and skill to be transferred to the student. If the teacher does not have enough skill and patience to help the student, then subject knowledge and skills carry a limited importance (Miller & Miller, 2002). Thus, the teacher has to have knowledge regarding how to teach the subject and the skills needed in practice apart from subject matter knowledge.

Besides, Armstrong, Denton & Savage (1978) emphasize that teachers need to have five basic skills in terms of teaching profession:

1) Determining performance goals
2) Knowing the student
3) Choosing the teaching method
4) Interaction with students
5) Evaluating teaching effectiveness

Apart from these, good teaching requires the integration and application of four knowledge bases: general pedagogical knowledge, classroom management, substantive (knowing what) and syntactical (knowing how) knowledge (Hollingsworth 1989). Shulman (1987) uses a similar schema but identifies a minimum of seven categories of knowledge needed for good teaching:

1) Content knowledge.
2) Pedagogical content knowledge:
3) General pedagogical knowledge, management and organization.
4) Curriculum knowledge
5) Knowledge of learners, theories of child development.
6) Knowledge of educational environment.
7) Knowledge of purposes and values.

Teaching processes having a dynamic structure with all its dimensions make it necessary for teachers to question and develop the qualities required by the duty. That is why, the studies MoNE holds in cooperation with universities and under the coordination of directory of teacher training and education about teacher competency demonstrates continuity. Teaching competencies are determined by teacher competency commission consisting of the representatives of the ministry and higher education associations (MEB studies, 2002, (öğretmen yeterlilikleri, MEB 2004). In the study, the general frame and the way it will be applied in the education process of general knowledge and special field dimensions of the teacher competency fields have been pointed at. The pedagogical knowledge competency of teachers has been put forward in detail under 14 main competency fields and 206 sub-competency fields. In the process, directory of teacher training and education determines the main competency fields in the teaching profession as a general competency draft.

A. Individual and professional values – Professional Development
B. Program and content knowledge
C. Recognition of students
D. Learning and teaching process
    - Being able to plan the learning and teaching processes
    - Applying the Learning and Teaching Processes
E. Observing and evaluating learning and development.

It is seen in these domains that there are 244 performance indicators related to 6 main competency fields and 39 sub-competencies regarding the school, family and social relations (MEB, 2004).

Apart from this, HEC has a list of teacher competencies that are qualified to apply teacher training programs. Students are aimed to obtain these competencies in teacher training programs through theoretical and practical activities. These competency fields are stated generally as below:

1) Competencies related to subject matter
2) Competencies related to the learning-teaching process
3) Observing, evaluating and recording the learning of the students
4) Supporting professional development (YÖK, 1999)

When looked at in general terms, both associations that are responsible for teacher training take into account similar core elements about teacher competencies .

2.6.3. Studies about Competencies

It is possible to come across with many studies about the teacher competencies in the literature. These competencies may show differences from society to society. However, it is seen that the studies conducted at different countries show similarities with the studies in our country. For example, Shulman (1987) determines that there can be at least seven categories in good teaching. Lunenberg (2002), on the other hand, explains that six basic competencies are necessary: subject matter competencies 2) pedagogical and didactical competencies 3) organizational competencies 4) communication competencies 5) learning and training competencies and 6) special competencies (such as problem-based, computer management competencies, and using computer competencies

According to Hoy & Woolfolk (1990), teacher competency perception is one of the unique teacher characteristics that are closely and continuously related to learning-teaching processes. Apart from being an important element in determining teaching strategies, it is stated that teachers whose competency perception are high give a more effective education compared to those having low competency perception (Minor et al., 2000; Tamir, 1998; Witcher et al., 2001).

On the other hand, Shallcross, Spink, Stephenson & Warwick (2002) examine two UK research studies on initial teacher education (ITE) trainees' confidence with their science knowledge. The main conclusion is that school experience is the most valid context in which trainees' scientific knowledge can be assessed. They also state that pedagogical content knowledge lies at the connection of subject knowledge, pedagogy and management. Valid and reliable verification of the link between teacher confidence and their science knowledge requires Continuing Professional Development (CPD) to integrate substantive, syntactic knowledge and a reflective view of pedagogical science content knowledge with subject specific teaching skills.

Subject matter knowledge should be further clarified here. Shulman and Sykes (1986) define subject matter knowledge as the organization of knowledge in the teachers' views. Thus, teachers should be familiar with inquiry skills about the area of knowledge they teach.

Shulman and Sykes (1986) define and list eight categories of the knowledge base of teaching, skills, and values:

1) General education including basic skills of reading, mathematics, writing etc.
2) Content knowledge in the domains in which teaching will occur
3) Content-specific pedagogical knowledge
4) General knowledge of pedagogical principles
5) Curriculum knowledge
6) Understanding of student diversity and individual differences
7) Performance skills (including voice, manner, poise)
8) Foundations of professional understanding (including history and policy; philosophy and psychology; ethics and so on)

Tamir (1988) confirms that pedagogical knowledge is comprised of four components, which are student, curriculum, evaluation, and instruction (that includes both teaching and management). Moreover, Tamir (1988) emphasizes that learning pedagogy is divided into three settings: a) theory courses, b) method courses and c) teaching practice. Tamir also claims that learning pedagogy, as part of preservice education has been a major problem. There is little or no coordination between the three components mentioned above.

According to Klaassen (2002), in Western European countries there is an evolution of teachers' pedagogical sensibilities. Klaassen conducted a qualitative study to examine the pedagogic factors or classroom difficulties that teachers faced. According to results of his study, many teachers are worried of moral issues that can arise in their classes because they are troubled with inappropriate behavior in the classroom. Teachers do not also find it easy to talk with colleagues and parents about pedagogical and moral issues. He also claims that teachers' pedagogical knowledge is not good and they are no longer familiar with talking about the pedagogical aspects of their work. They have difficulties about how to deal with their students on relational, personal, and moral grounds. Based on results, Klaassen suggested that teachers need to reestablish and reshape a relevant pedagogical language in their daily work.

According to Chen & Ennis (1995), teachers connect subject content knowledge with pedagogical knowledge in teaching to enhance the content comprehensibility. They collected data through interviews and classroom observations to examine the content knowledge transformation process associated with teachers' curricular decisions in the physical education domain. Findings indicated that the teachers' curricular decisions regarding content inclusion or exclusion were primarily based on their perceptions of student learning abilities.

In related studies conducted in Turkey, Izci (1999) has studied the pedagogical knowledge competency levels of teachers teaching at intermediate schools. Results show that, although the assessment and evaluation competencies of teachers are generally good, there are still some problems at some fields. For example, the competency of teachers in evaluating the relationship between the aims of the lesson and success is rather low. Apart from this, their competency regarding taking into account the interest and needs of the students, feedback, correction and providing hints are low. There is also a decrease in teachers researching and making use of inservice training. The pedagogical knowledge of male teachers is seen to be considerably low. When their area is taken as reference for their pedagogical knowledge, competencies are found to be lower than other branch of teachers.

In another research, Güven (1997) studies teachers' competency levels regarding professional knowledge and skills in classroom teachers who serve in the 1st level of basic education. The research was conducted among a total of 752 teachers, 331 of whom are females and 421 males. According to the results, although there are significant differences in the competency levels of teachers regarding teaching methods in gender, experiences and type of school graduated from, no significant difference was observed in terms of classroom management and discipline. The variables stated regarding the assessment and evaluation competencies, a significant difference could not be seen regarding gender and the type of school worked at.

In a research conducted by Celep (1998), on the other hand, the teacher competency of the primary school 1st level teachers and administration, working group and beliefs related to students and student control approaches have been determined and measured. According to the results, most of the teachers are in cooperation with each other for the success of the students, and the school is a family within which everybody helps one another. It has also been found that teachers apply the discipline rule to disturbing students instead of trying to control them with discipline rules. Apart from this, students expect that they have to obey all the rules set forward by the teacher.

Şişman and Acat (2003) emphasized that there has been a positive increase in perception of the subject knowledge competencies of preservice teachers and inservice teachers. Apart from this, those who have just started the profession perceive the characteristics related to pedagogical knowledge more positively than those who have been in the profession longer and who do not perceive these characteristics as positive as the new starters. They also concluded that preservice teachers' perceptions of their own competencies have increased positively after the teaching practices.

2.7. Summary of Findings of Previous Studies

Technology in Education

1) Technology has an important role for educational area both in terms of learning and teaching processes. If technology is used appropriately, it can be very beneficial to enhance educational productivity such as achievement, learning style, attitude, motivation etc. (Barron et al., 2003; Byrom & Bingham, 2001; Clements & Sarama, 2003; Edyburn et al., 2005; Fox, 2005; Hew & Brush, 2007; Kozma, 1991; Kulik, 2002; Lee, 2000; Waxman et al., 2003)
2) Most of the studies reveal positive relationship between technology and students' outcomes at all levels of education and subject areas (Akkoyunlu & Orhan, 2001; Edyburn et al., 2005; Fox, 2005; Lee, 2000; Mitchell & Fox, 2001; Waxman et al., 2002; Viadero, 1997).
3) While some students doing multimedia presentations, collecting and interpreting data for projects as a high level integration, a significant number of teachers do not use technology many times in a week in their activities (Cuban et al., 2001).

Use of Computers in Classrooms

4) Yildirim (2000) concludes that teachers' attitudes, confidence and liking of technology developed after the computer literacy course.
5) Computers provide students with easily accessible of knowledge and increase their motivation (Keller & Suzuki, 1988; Kinzie, 1990; Waxman et al., 2002).
6) Some researchers claim that the use of computers in class is sometimes a failure (Clark 1994, Stevens 2001). Computers fail in classroom instruction because of

hardware related issues, software limitations, teachers' attitudes and lack of skills to implement instructional computing, and so on.

7) Providing coursework and inservice opportunities are positive steps toward encouraging teachers to take advantage of the technology available to them. However, research has shown that significant numbers of teachers are computer-anxious and that this anxiety interferes with their skills to integrate technology in their classroom teaching (Howard & Smith, 1986).

Integrating Technology into Education

8) Technology integration involves teachers' perceptions and beliefs about profession and technology (Woodbridge, 2003).
9) Researchers have identified many barriers in technology integration, including limited equipment training and time as well as teachers used instructional methods and their perceptions about teaching (Butler & Sellbom, 2002; Cox et al., 1999; Ertmer, 1999; Granger et al., 2002; McDermott, & Murray 2000; Medcalf-Davenprot, 1998; Mumtaz, 2000; Pelgrum, 2001; Yildirim, 2007)
10) Yildirim (2007) concludes that although teachers have been usually held responsible for the success or failure of ICT in schools, there are indeed a number of barriers for the diffusion of ICT.

Training of Computer Teachers

11) Computer teachers who graduated from CEIT departments are mainly responsible for integrating technology in to basic education in Turkey.
12) In the World, the focal point in the technology integration has shifted from learning about ICT to learning through to ICT. For example, the main concern is to teach using the internet or educational software in students' assignments inside and outside the schools (EURYDICE, 2001; Law & Plomp, 2003).

Teachers' Professional Growth

13) The preservice teachers' professional growth has been studied in the literature (Calderhead, 1993; Carter, 1994; Clarke & Hollingsworth, 2002; Grossman, 1992; Kagan, 1992; Marland, 1993; Ross & Bruce, 2007 Zeichner & Gore, 1990) whereas a few studies (Deryakulu& Olkun, 2007) are available in the Turkish literature.
14) Supported by many scholars, student teachers feel that successful teachers promote the personal, psychological and social growth of their students (Brookhart & Freeman, 1992; Mahlios & Maxson, 1995; Weinstein, 1989).

Perception of Teaching

15) There are bodies of literature on the idea that teachers' perceptions about teaching and learning their subject area significantly influence their performance in the classroom as well as their students' outcomes (Fajet et al, 2005; Holt-Reynolds, 1992; Koca & Sen, 2006; Pajares, 1992; Prawat, 1992; Stipek et al 2001).
16) Moreover, teachers' perceptions are positively correlated with characteristics of teachers. (Koca & Sen, 2006; Maxson & Mahlios, 1994; Minor et al., 2000; Weinstein, 1989, 1990; Witcher et al., 2001)
17) Pajares (1992) emphasizes that teachers' beliefs and perceptions of teaching should become an important focus of educational environment. He underlined that these perceptions can even affect the practices of beginning teachers.

Teacher Competencies

18) There is an important emphasis upon subject matter and its application as a key component of initial teacher training courses. Tamir (1998) states that teachers

should be knowledgeable in their subject matter and in competent of teaching performances.

19) The focus upon teachers' knowledge of subject matter and its application in the classroom is not new (McNamara, 1991). However, there are a few studies which investigate preservice and inservice computer teachers' knowledge of subject matter and what they reveal must be a subject of concern in Turkey.

20) In the literature, there is a body of research about teachers' perceptions of teaching suggesting a strong connection between teachers' perceptions and practices (Corcoran, 1981; Labrana, 2007; Macnab & Payne, 2003; McDiarmid 1990; Parker, 1998; Weinstein, 1989; Woods, 1998).

21) In the studies in the literature concerning professional competencies, good teachers are generally thought to have sufficient knowledge of the content area which they teach (Minor et al., 2000; Reed & Bergemann, 1992; Skamp, 1995; Weinstein, 1989). Researchers clearly claim that good teachers are undoubtedly those who transfer their knowledge to their students (Reed & Bergemann, 1992; Skamp, 1995; Segall & Wilson, 1998; Segall, 2004).

As a conclusion, it can be concluded from the literature that computer teachers' professional growth in terms of their perception of teaching and pedagogical competencies and subject matter knowledge are important factors for effective technology integration in schools.

CHAPTER 3

METHODOLOGY

3.1. Introduction

This study seeks to understand professional growth of computer teachers at basic education (K8) in terms of their perceptions towards teaching and their competencies. This chapter highlights the research methodology and procedures used in the study which consists of the following sections: research questions, research method, and research design, and instrumentation, participants of the study, procedures, data analysis, assumptions and limitations.

3.2. Research Questions

The purpose of this study, as has already been said in the introduction, is twofold. The main purpose is to investigate the professional growth of the basic education computer teachers in terms of their perceptions of teaching and their competencies. The second one is to focus on these teachers' field experiences to understand the effect of these variables on their practices. Therefore, the way they apply what they have previously learned to practice is also investigated in this study.

In order to fulfill the above mentioned purpose of the study, the following two main research questions are asked;

1) What is the professional growth of the basic education computer teachers in terms of their perceptions towards teaching and their competencies?
2) To which extend do basic education computer teachers use their pedagogical and subject matter skills in their teaching practices?

The following sub-questions are answered in parallel with main questions:

Sub-questions

1.1. What are the perceptions of preservice and inservice computer teachers about teaching as a profession?

1.2. What are the preservice and inservice computer teachers' pedagogical competencies?

1.3. What are the preservice and inservice computer teachers' subject matter competencies?

1.4. What are the preservice teachers' opinions on factors that contribute to successful technology integration in schools while they practice teaching?

1.5. What are the inservice teachers' opinions on factors that contribute to successful technology integration in schools at which they work?

1.6. In what ways preservice teachers differ from each other across their university years in terms of perception of teaching?

1.7. In what ways preservice teachers differ from each other across their university years in terms of pedagogical competencies?

1.8. In what ways preservice teachers differ from each other across their university years in terms of subject matter competencies?

1.9. Is there any mean difference in preservice computer teachers' perception of teaching, pedagogical competencies and subject matter competencies based on their high school education?

1.10. Is there any mean difference computer teachers' perception of teaching, pedagogical competencies and subject matter competencies based on gender?

2.1. How are the preservice and inservice computer teachers' perceptions towards teaching?

2.2. How do preservice computer teachers apply their pedagogical and subject matter knowledge in their teaching practice?

2.3. How do inservice computer teachers apply their pedagogical and subject matter knowledge in their teaching practices?

2.4. Which factors (e.g., environmental and professional factors) do affect computer teachers' perceptions towards teaching?

2.5. How these factors (e.g., environmental and professional factors) do affect their teaching practices?

2.6. How preservice computer teachers' perceptions do affect their pedagogical and content knowledge during teaching activities?

2.7. How inservice computer teachers' perceptions do affect their pedagogical and content knowledge during teaching activities?

3.3. Research Method

Research deals with investigating and understanding social phenomena in education. Husen (1988) states that educational research concern with research questions which are discovered in an acceptable and with the appropriate techniques. Because research questions in educational study come out of special concepts and understandings of social facts to develop of problems for inquiry. Fraenkel and Wallen (2000) also affirm that "scientific research method is considered by researchers the most likely way to produce reliable and accurate knowledge and involves answering questions through systematic and public data collection and analysis" (Fraenkel & Wallen, 2000, p. 23). Based on their statement, research methodologies such as experimental research, correlational research and qualitative research are commonly used in educational research. In this study mixed method research approach is employed as a research methodology to answer the research questions.

3.4. Mixed Method Research

The purpose of this study was to understand basic education computer teachers' professional growth in terms of their perceptions of teaching and their competencies. In order to seek answers to this broad purpose, mixed research method is used in this study. Mixed methods research can be defined as the class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods and approaches into a single study (Johnson & Onwuegbuzie, 2004). Onwuegbuzie and Leech (2004) also characterized mixed method research as the bridge the division between quantitative and qualitative research. In addition, they claimed that it is a third research paradigm in social studies.

In the social research, there are two main research paradigms which are positivism and anti-positivism or interpretivism (Trochim, 2000). In positivism, research methods focusing on quantitative analysis (i.e., surveys, questionnaires and experimental design) are essential, whereas in anti-positivism the research techniques focusing on qualitative analysis (i.e., interviews, observations and document analysis) are important (Crotty, 1998). Johnson and Onwuegbuzie (2004) state that mixed method is another paradigm in research arguing that it makes use of the pragmatic method and system of philosophy. According to Ivankova, Creswell & Stick (2006), social science researchers use mixed method designs for their studies. Researchers (Creswell, 2005; Tashakkori & Teddlie 2003) define the concept of the "mixed method" as the integration of quantitative and qualitative data at some stage of the research process in a single study to have a better understanding of the research problem.

From these explanations about mixed method research, it is clearly seen that mixed method includes techniques from both quantitative and qualitative traditions and combines them in a unique since the research questions could not be answered sufficiently with a single method. This is an indicator of the complexity of the components of this study. The mix of quantitative and qualitative data is the best approach to deal with the problem and answer the research questions, increasing the overall reliability of data gathered (Creswell, 2003). Furthermore, mixed methods research is not used to replace either of quantitative and qualitative approaches. It draw from the strengths and minimize the weaknesses of both in a single research study

(Creswell, Clark, Gutman, & Hanson, 2003; Greene, Caracelli, & Graham, 1989; Johnson & Christensen, 2004; Johnson & Onwuegbuzie, 2004; McMillan & Schumacher, 1993; Teddlie & Tashakkori, 2003).

In this study, a mixed research method is followed in terms of the design of the research, data analysis, validity strategies, procedures and rationale behind the study. Johnson and Onwuegbuzie (2004) note that mixed method employs the philosophy behind qualitative and quantitative research; therefore, it supports the pragmatic method of the classical pragmatists. Maxcy (2003) points out that taking a pragmatic, balanced or pluralist position assists improving communication among researchers from different paradigms when they attempt to advance knowledge. According to Hoshmand (2003) pragmatism sheds light on how research approaches can be mixed fruitfully. Regarding all these accounts, in this study research approaches are mixed in ways that offer the best opportunities for answering the research questions that the study aims to give answers.

Morgan (1998) and Morse (1991) explain that there are two important dimensions of the mixed method research study such as paradigm emphasis and time ordering of the qualitative and quantitative parts that are accomplished in a sequence or concurrently. In this study, mixed method research design is based on the paradigm emphasis and time ordering of the quantitative and qualitative phases. That is, in this study the process of mixed methods research is comprised of six separate steps:

1) Determination of the research questions
2) Determination of appropriateness of a mixed design approach,
3) Selection of the mixed method
4) Collection and analysis of the data,
5) Interpretation of the data,
6) Drawing conclusions and writing the final report (Johnson & Onwuegbuzie 2004).

According to Johnson and Onwuegbuzie (2004), there are also five main principles to conduct the mixed methods: 1) triangulation 2) complementarities 3) initiation 4) development and 5) expansion.

The rationale behind using the mixed research method in this study is as follows:

1) The method used in the study provides stronger data for a conclusion through convergence and justification of the results.
2) It adds understanding that might not be achieved in a single method.
3) It is used the generalizability of the results
4) It constructs to inform theory and practice
5) It provides quantitative and qualitative research strengths
6) It answers a broader and more complete variety of research questions
7) It provides data triangulation to overcome the weaknesses or intrinsic biases and other problems caused by the use of a single method.

3.5. Research Design Model (Mixed Method Sequential Explanatory Design)

There are numerous designs of the mixed methods research reported in the literature (Creswell et al., 2003; Tashakkori & Teddlie 2003). This study employs one of the most popular mixed method designs in educational research, the sequential explanatory design, which consists two distinct phases (Creswell, 2003; Creswell et al., 2003; Tashakkori & Teddlie, 1998) that makes the design applicable in both social and behavioral science research (Kinnick & Kempner, 1988; Krathwohl, 1998). This design is mostly used for explaining initial quantitative findings with qualitative data or to form groups based on quantitative findings to guide subsequent qualitative investigation (Tashakkori & Teddlie, 1998). It is a two-phased mixed method approach in which quantitative data collected and analyzed first. The second phase is the qualitative phase one in which the initial quantitative results are explained with a deeper understanding. The following figure shows the mixed method research design models (Johnson & Onwuegbuzie, 2004; Morgan, 1998; Morse, 1991; Tashakkori & Teddlie, 1998).

Johnson and Onwuegbuzie (2004, p:22) explains that "qual" represents qualitative, "quan" represents quantitative, "+"represents concurrent, "→"represents sequential, capital letters indicate high priority, and lower case letters indicate lower priority.

	Concurrent	Sequential
Equal Status	QUAL + QUAN	QUAL → QUAN QUAN → QUAL
Dominant Status	QUAL + quan QUAN + qual	QUAL → quan qual → QUAN QUAN → qual Quan → QUAL

Figure 3.1 Mixed-method design matrixes based on Johnson and Onwuegbuzie (2004)

In this design, based on mixed methods sequential explanatory design the researcher at first collects and analyzes the quantitative data. Secondly, the qualitative data are collected and analyzed, and this helps explain the quantitative results obtained in the first phase. As suggested by Morse (1991), this design is useful when unexpected results are obtained due to a quantitative study. The rationale behind this approach is that the quantitative data and their subsequent analysis provide a general understanding of the research problem while the qualitative data and their analysis help refine and explain the statistical results by exploring participants' views more deeply (Creswell 2003; Rossman & Wilson 1985; Tashakkori and Teddlie 1998). Morse (1991) supports that the advantages of the design of a study in which mixed method are used include straightforwardness and opportunities for the exploration of the quantitative results in more detail. In this sequential explanatory study priority, implementation, and integration of the quantitative and qualitative approaches (Ivankova et al., 2006) are taken into account.

3.5.1. Priority

Morgan (1998) and Creswell (2003) state that priority refers to researchers' attention about approaches, quantitative or qualitative (or both), throughout the data collection and analysis process in the study. In the sequential explanatory design, since the quantitative data collection comes first in the sequence and often represents the major aspect of the mixed-method data collection process, priority is given to the quantitative approach. The qualitative component, on the other hand, follows as the second phase of the research (Creswell, 2003).

In this study, the researcher decides to give priority to quantitative data collection and analysis, because the purpose of the study is to understand basic education computer teachers' professional growth in terms of their perceptions and competencies. Therefore, the quantitative phase of the study focuses primarily on revealing the description of students about selected variables. In this phase, the data collection is limited to a cross-sectional survey and the data analysis employs only two statistical techniques: descriptive and analysis of variance. The goal of the qualitative phase, on the other hand, is to explore and interpret the statistical findings obtained in the quantitative part. In this part, the researcher decides to use different data sources such as interviews and observations to enhance the depth of qualitative analysis.

3.5.2. Implementation

Implementation means how the collection and analysis of the quantitative and qualitative data come in sequence (Creswell et al. 2003; Greene et al., 1989; Morgan 1998). Johnson and Onwuegbuzie (2004) state that in the sequential explanatory design the data are collected over a period in two consecutive phases and that a researcher collects and analyze first the quantitative data and then the qualitative data, which are connected to the outcomes of the first phase. Actually, the decision to follow the quantitative-qualitative data collection and analysis sequence in a design depends on the purpose of the study and the research questions (Creswell 1998; Greene et al., 1989).

In this study, quantitative data was collected using questionnaires at first because the researcher wanted to describe computer teachers' development on the selected variables and to purposefully select participants for the second phase of the study. Next, the researcher collected and analyzed the qualitative data in order to explain results of the first phase. Thus, the quantitative data and statistical results provided a general understanding about computer teachers' development while the qualitative data and its analysis were used for a profound understanding of why certain factors significantly or not significantly affected the participants' persistence.

3.5.3. Integration

Where the integration of the quantitative and qualitative methods occurs is about integration phase of the study (Creswell et al. 2003; Greene et al., 1989; Tashakkori & Teddlie 1998). In the mixed-methods sequential explanatory designs, a researcher connects the quantitative and qualitative phases in the intermediate stage when the results of the data analysis in the first phase of the study guide the data collection in the second phase (Hanson, Creswell, Clark, Petska & Creswell 2005). Moreover, Creswell et al. 2003 explain that the two phases are connected while selecting the participants for the qualitative follow-up analysis based on the quantitative results of the first phase. Johnson and Onwuegbuzie (2004) highlighted another connecting point is the development of the qualitative data collection protocols based on the results of the quantitative phase to investigate those results more deeply through collecting and analyzing the qualitative data in the second phase of the study.

In this study, the researcher connected the quantitative and qualitative phases during the intermediate stage in the research process. The second connecting point included developing the interview questions for the qualitative data collection based on the results of the analysis in the first phase. The researcher mixed the quantitative and qualitative approaches at the study design stage by introducing both quantitative and qualitative research questions and so doing he integrated the results of the quantitative and qualitative phases during the interpretation of the outcomes of the whole study.

As a conclusion, the thrust of this study is mainly mixed method sequential explanatory design in nature. The researcher employed the questionnaire as the primary data collection tool but since questionnaire was limited in its representation of the whole picture, this study was complemented by interviews, observations and document analysis which were the qualitative data collection tools. That is, this study is comprised of quantitative and qualitative research methods. Tashakkori and Teddlle (2003) assert that with the development of both qualitative and quantitative research it seems that mixed method has become superior to single approach designs, which is the main reason behind the use of quantitative and qualitative data collection and data analysis methods in this study. Questionnaires were used for collecting quantitative data, while, interviews, observations and document analysis were used for qualitative data. Quantitative methods were used to gather information from a large sample of preservice and inservice teachers and to look at overall patterns, whereas qualitative methods were used because they allowed the researcher to understand the study from the participants' perspectives rather than the researcher's (Merriam, 1998).

3.6. Instrumentation

As previously explained, in this sequential explanatory mixed design, both quantitative and qualitative data collection instruments were employed. Data were collected through such research instruments as questionnaires, interviews and observations. In the first quantitative phase of the study, the research questions focused on basic education computer teachers' perceptions about teaching, their pedagogical and subject matter competencies and their views about technology integration into schools. In order to answer these research questions, the researcher developed new questionnaires and adapted from existing instruments by utilizing the literature review in the field. After this phase, pilot studies were conducted in order to provide reliability and validity of the questionnaires. In the second qualitative phase, the research questions were addressed for an in-depth understanding of computer teachers' perceptions toward teaching, their competencies and their opinions about technology integration. For this purpose, interviews and observation schedules were prepared by the researcher by taking expert opinions which were based on the related literature. In the following section, more information is given about the development of these instruments.

3.6.1. Quantitative Instruments

In the first phase, a quantitative research procedure was applied and, data were gathered through questionnaires. A questionnaire consisting of a series of questions and other prompts is described as an inexpensive way of collecting data from a large group of respondents. It enables the researcher to obtain the information about the thoughts, attitudes, feelings, beliefs, values, perceptions, personality, and behavioral intentions of a large group of people with minimum cost (Johnson & Christensen, 2004). The following questionnaires were used to collect quantitative data from participants:

1) Demographics
2) Teachers' Perception of Teaching (TPoT) Questionnaire
3) Factors affecting technology integration Questionnaire
4) Pedagogic Competencies Questionnaire
5) Subject matter competencies Questionnaire

3.6.1.1. Demographics

The demographic information section included 10 items to collect background information about the participants. These items consisted of gender, age, CGPA, secondary schooling, parents' education, parents' profession, university entrance scores and range of department preference in the form of university entrance exam. Although the same instrument was applied to collect data from both preservice and inservice teachers, there are some difference items in the demographics part of the inservice teachers (Appendix A).

3.6.1.2. Questionnaire of the Teachers' Perception of Teaching (TPoT)

To measure the perceptions about computer teaching as a profession, previously developed instruments about computer teaching perceptions were examined by the researcher. An appropriate instrument was not found for the computer teachers' perception towards teaching. Therefore, the researcher decided to develop a new instrument for this aim by utilizing from literature. As Johnson & Christensen (2004) affirm, the construction of a questionnaire corresponds with the researcher's research objectives. For this purpose, firstly, focus group meeting interviews were held in order to deeply understand the thoughts of prospective computer teachers about teaching computer as a profession. Interviews were transcribed and coded by researcher by using content analysis which is process of bringing structure and meaning of the collected data (Marshal & Rossman, 1999). Based on analysis 44 closed perceptions items with 5-likert type scale from strongly disagree to strongly agree were formed by the researcher. The questions were close-ended and required participants to choose from a limited number of responses (Johnson & Christensen, 2004). These 44 items were checked by experts before the pilot study in order to provide content validity. After that, the pilot study was conducted in order to form the final shape of the perception questionnaire. One hundred and fifty (150) prospective computer teachers filled in this questionnaire. After collecting data, factor analysis was run by using SPSS in order to determine factors and to provide construct validity. Of the 44 items administered, 28 were removed from the questionnaire by taking expert view, because they were either uncompleted or their factor loading values were less than 0.50. Factor loadings greater than .50 are considered in order to obtain a practical significance item (Hair, Anderson, Tatham & Black, 1998; Robinson, Shaver & Wrightsman, 1991).

Based on factor analysis results, this questionnaire formed 2 sub-dimensions and 16 items. The first dimension was about their general perceptions about the roles of computer teachers (e.g., I believe that computer teachers open the minds of their students. I think that computer teachers contribute to the development of technological knowledge in the society) and included 9 items. The second dimension was about their personal satisfaction with computer as a profession (e.g., I would choose computer education again. computer teaching is an exciting job for me) and included 7 items. According to criteria of Eigenvalue is greater than 1, these 2 factors explained 49.23 % of the variance. Moreover, the reliability check of the questionnaire was carried out by calculating Cronbach's alpha coefficient. When Likert type scale was used, calculating the Cronbach's alpha coefficient is appropriate for reliability. If the value is above .70, the questionnaire could be considered as reliable (Pallant, 2001). In the current study, the Cronbach alpha coefficient was calculated, since Likert type scale was used. Reliability of the first factor was found 0.88 and that of the second factor was 0.87. This indicates that there is a high consistency among factors. Moreover, the overall Cronbach-alpha reliability of the perception scale was 0.90. The same questionnaire was used for both preservice and inservice teachers (Appendix B).

3.6.1.3. Questionnaire of the Factors Affecting Technology Integration into Schools

In order to obtain data from basic education computer teachers' views and obstacles about technology integration into schools, a survey was developed by the researcher by employing some previous questionnaires from the related literature. The questionnaire used to collect data for this research was adapted from technology attitudes and perception surveys which were developed by Brush et al. (2003). This questionnaire was firstly translated into Turkish by the researcher. It originally included 2 sections which were about the attitudes toward technology integration and environmental resource barriers. After translating the questionnaire, items were checked by a Turkish language expert to provide grammatical and semantic accuracy. After making necessary revisions, the pilot study was conducted to determine the reliability and validity of the survey.

Three hundred and seventy (370) prospective computer teachers from Hacettepe University, 19 Mayıs University and Selcuk University filled in this survey. Gathered data were analyzed by using SPSS package program. After factor and reliability analysis, expert opinions were obtained to provide content validity. Items were regulated and reshaped according to experts' views. The questions were close-ended and required participants to choose from a limited number of responses and rating scale consisted of 5-likert type scale from least effective to most effective.

The final form of the survey was administered as pilot to provide reliability and validity. One hundred and fifty computer teachers from 19 Mayıs University and Middle East Technical University participated in this survey. Data were analyzed by using SPSS package program. The overall Cronbach-alpha reliability of the survey was found 0.93. Twenty seven likert-type items from the least effective to the most effective and one open-ended question formed the questionnaire of the factors affecting technology integration in to schools. Following items can be given as example:

1) Number of computers in IT lab
2) Teachers' attitude towards technology
3) Teachers' knowledge about technology integration
4) Content to be taught

Same items were asked to both preservice and inservice teachers. This part of the survey can be seen in Appendix C

3.6.1.4. Questionnaire of the Pedagogical Competencies

To measure pedagogical competencies of participants, studies regarding pedagogical competencies of the Ministry of National Education (MoNE) were employed. Recently, MoNE authorities and experts have conducted some studies and workshops to determine teachers' competencies. Teachers, instructors, primary school inspectors and measurement and evaluation experts participated in these studies (MEB 2004). According to the results of these studies, six competency categories were determined;

1) Professional development
2) Recognition of students
3) Teaching and learning process
4) Measurement and evaluation
5) Associations with School-Parent and Society
6) Knowledge of subject matter

The MoNE authorities analyzed these categories. The final form of these competency categories were distributed to schools and universities. From these categories, B (Recognition of students), C (Teaching and learning process) and D (Measurement and evaluation) categories were chosen by the researcher to determine prospective computer teachers' pedagogic competencies. These categories were preferred because participants of this study included preservice teachers who were practicing teaching in their last semester. While practicing teaching, they prepared lesson plans, presented selected topics, and evaluated their students. Therefore, thirty three close-ended items were selected by taking expert opinions from these general items. The questions were close-ended and required participants to choose from a limited number of responses. Rating scale consisted of 5-likert type scale from incompetent to fully competent pointing in terms of pedagogical competence.

Researcher conducted a pilot study to determine the reliability and validity of the items. 370 preservice computer teachers from Hacettepe University, 19 Mayıs University and Selcuk University filled in the questionnaire of pedagogical competency. Obtained data were analyzed by using SPSS statistical package program. Eleven items were dropped from the final questionnaire through expert opinions about the results of this analysis. Finally, the pedagogic competency section included 22 items for three sub-sections in the pedagogical competency categories, 8 items of which measured the competence for preparing lesson plans (e.g., Stating learning goal and objectives in the lesson plan, taking in to consideration students' learning style and their individual differences among students in the lesson plan); 9 items the teaching process (e.g., using time effectively and efficiently in the class, using alternative strategies for technology supported environment) and five items measured measuring the evaluation (e.g., determining and using appropriate measurement tools to evaluate students, using technology in assessment of the students). These sub-dimensions were kept the same to ensure consistency with the analyses of the MoNE.

The overall Cronbach-alpha reliability of the survey was found 0.96. The same questionnaire was applied to collect data for preservice and inservice teachers. This part of the questionnaire can be seen in Appendix D.

3.6.1.5. Questionnaire of the Subject Matter Competencies

In order to measure subject matter competencies, after preparing the necessary literature review, the researcher decided to adapt subject matter competency questionnaire prepared by the MoNE and measuring computer teachers' subject matter competencies. Since computer teacher education was not implemented commonly all over the world, there were no exact instruments concerned in the literature. Recently, MoNE authorities and experts have conducted some studies and workshops to determine teacher subject matter competencies. In these studies, subject matter competencies were determined by experts. These experts prepared and developed subject matter competency indicators for basic education computer teachers to present Directorate of the Teacher Education at MoNE. These indicators were distributed to some computer teachers in schools via the Directorate of the Teacher Education as a pilot study. The MoNE experts claimed that there were four sub-domains in these determined computer teachers' subject matter competencies. These are:

1) Technological concepts and implementations
2) Designing learning environment
3) Teaching-Learning-Technology

4) Professional development (MEB, 2005)

There were 20 indicators in the first domain (technological concepts and implementations), 18 indicators in the second domain (planning and learning environment), 31 indicators in the third domain (teaching-learning environment) and 18 indicators in the fourth domain (professional development). These indicators were also categorized into three levels basic, middle and mastery. Totally 87 indicators composed subject matter competencies. What expected from teachers with these competencies were; following innovations, developing themselves and using their knowledge into teaching-learning environment (MEB, 2005). From these indicators, a subject matter competency questionnaire was formed by the researcher by additionally taking expert opinions. Because the second and third domain indicators also included pedagogical competencies, they were eliminated in subject matter competency questionnaire by taking expert opinions. Moreover, some indicators among the levels were the same; therefore, they were also repeated. Finally, twenty six items consisted of subject matter competency questionnaire and the rating scale consisted of 5-likert type scale from incompetent to fully competent.

150 Prospective computer teachers from Middle Technical University, Ankara and 19 Mayıs university, Samsun filled in this questionnaire as a pilot study in order to provide validity and reliability. After the pilot study, three items were dropped from the further implementation, since they were not responded or double responded by participants and they also decreased the reliability of the instruments. Finally, 23 items with the three subsections, 10 items in the basic sub-dimension (e.g., installing and updating necessary software programs, maintaining system regularly), 7 items in the middle sub-dimension (e.g., selecting, evaluating and using software which are developed learning and teaching activities) and 6 items in the mastery sub-dimension (e.g., installing appropriate network system and using this system to connect with other computers in school) consisted of subject matter competency questionnaire. As panel of experts in MoNE were made necessary studies about factor analysis, these sub-dimensions were kept to

provide consistency with their analysis. Moreover, the Cronbach-alpha reliability of this part was found 0.94. Moreover, the same questionnaire was applied for preservice and inservice teachers. This questionnaire can be seen in appendix E

3.6.2. Qualitative Instruments

Based on the mixed method research, after quantitative data collection procedure, qualitative data were collected in this study. In the qualitative research procedure, data were gathered through interviews, observation and document analysis. Yin (2006) emphasizes that using a multiple approach facilitates an in-depth explanation of certain variables tested in the first phase

3.6.2.1. Interview

One of the most commonly used research technique in the art of sociology is doing interviews (Briggs, 1986, Marshal & Rossman, 1999). In this study, interviews were scheduled in different times throughout the research. Focus group and individual interviews were conducted for preservice and inservice teachers after teaching practices. Patton (1987) states that interviewing helps the researcher understand other peoples' insights and perspectives. In this study, the researcher tried to get the experiences, thoughts, ideas, comments, perceptions and responses of the participant through interviews. Yıldırım & Şimşek (2005) stress that flexibility, response rate, behaviors not seen, the control of the environment, the order of the questions, sudden responses, confirmation of the data provider, comprehensiveness and in-depth information are the advantages of interviews. Guba & Lincoln (1989) identify two types of interviews, which are structured and unstructured. A structured interview consists of an interview protocol with close-ended standardized questions and an unstructured interview consists of direct interaction between the researcher and an interviewee or group.

According to Trochim (2000), since each interview tends to collect unique responses from all interviewees, analyzing unstructured interview data is difficult, although it has some advantages. In the study, a structured interview schedule was developed by the researcher by taking expert opinions to explore how preservice and inservice computer teachers integrate and transfer their pedagogical and technological knowledge into their teaching practices. Interview schedule which was prepared by the researcher focused on preservice computer teachers' views and thoughts while they were doing teaching practice in schools. Moreover, interviews with inservice teachers were done in order to deeply understand what they think about technology integration in schools and how they reflect their pedagogic and subject matter competencies. Before the final interviewing, this interview schedule was piloted to check the reliability and validity of the questions. Four prospective teachers who completed their teaching practices and 2 inservice teachers were interviewed for the pilot study. During the analysis of the pilot study, the researcher realized that some interview questions were not understood by the interviewees. Moreover, experts and peers opinions were obtained in order to get trustworthiness of the interview schedule (Creswell, 2003). Finally, the interview schedule was reviewed and reformed in light of these explanations of the experts. In the final form of the schedule, interviews started with initial questions to obtain information about the interviewees and general ideas about their technology integration. It also contained 12 main interview questions including computer teaching perceptions, views about technology integration and pedagogic and subject matter knowledge. This interview schedule can be seen in appendix F. Tape recorder was used by taking the consent of interviewees during the interviews. The interview questions were related to the questionnaires that had been previously applied to the participants and the interviewing process took approximately 30-60 minutes. Interviews were transcribed by the researcher as soon as they were completed. Data triangulation was applied to overcome the weaknesses or intrinsic biases and other problems caused with the use of a single method; thus, qualitative data were collected by follow-up face-to-face and by focus-group interviews after the quantitative data collection procedures. Yıldırım & Şimşek (2005) point to data triangulation as one of the most important criteria for the provision of validity and reliability of a study and for testing the plausibility of the findings.

3.6.2.2. Observation

The other data collecting method in qualitative study is observation. Marshal and Rossman state that "observation entails the systematic noting and recording of events, behaviors and artifacts (objects) in the social setting chosen for study." (1999, p. 109). There are two types of observation, which are participant observation and direct observation (Briggs, 1986, Marshal & Rossman, 1999, Trochim 2001; Yıldırım & Şimşek, 2005). In participant observation, a researcher needs to become a participant in the culture or in the context being observed. Although participant observation has some advantages, it often requires a long time (i.e., months or years) for intensive study since the researcher needs to be accepted as a natural part of the culture in order to assure that the observations are of the natural phenomenon (Trochim 2001). On the other hand, in a direct observation, the researcher does not need to be a participant in the context and culture.

Instead, the researcher tries watching rather than taking part. Moreover, direct observation is not as long as participant observation. Unlike interviewing, in the direct observations the observer does not actively query the respondent (Trochim, 2001). In the current study, observations were conducted as direct observation to determine how computer teachers integrated and transferred their pedagogical and technological knowledge (subject matter) into their teaching while they were teaching the subjects during their teaching practices. Because teaching practices were the first experience for teacher candidates before they worked inservice, it is important to understand for their future career what was going on in actual practice time. Before conducting observation, the researcher prepared the observation procedure and schedule by focusing on the research problems. The following aspects were considered by the researcher during the observations:

1) **Context:** Physical description of the classroom, teaching and learning environment, logistics of the classroom, (desk, tables, arrangement of computers and other equipments).
2) **Pre-instructional process:** Planning of the lesson, stating the goals, objectives and behaviors of the lesson plan, acknowledgement of the students and so on.
3) **Instructional process:**. Preparing and conducting activities, giving examples, using teaching methods or strategies, using instructional materials and tools, providing practice, interaction with students.
4) **Classroom management:** Asking questions to students, listening to students and responding to their questions, motivating students, using verbal or body language, using time.
5) **Post instructional process:** measuring and assessing the students and giving feedback to them, checking for understanding.

These points are also related to the teacher competencies in the questionnaire which was administrated in the quantitative part of the study.

Note taking and a video camera recording were used to record classroom activities and teacher behaviors during the sessions by getting permission from teachers. Observation schedule was prepared by the researcher by taking expert opinions. A video was used to record environment of the classroom before the lessons started and the final 10 minutes of the lessons. One classroom observation session lasted 45 minutes in total. The researcher tried to be careful about not disturbing the normal classroom environment during the observations. After the observation sessions, the researcher transcribed and wrote from notes and videos. After that, the researcher coded them by focusing on the research problem and questions. Observation procedure can be seen in appendix G.

3.6.2.3. Document Analysis:

Document analysis is the review of meetings' notes, logs, announcements, letters, and so on are useful in developing an understanding of the setting or the group studied (Marshal & Rossman, 1999). Throughout the study, prospective teachers were asked to prepare a lesson with multimedia learning environment by using technology. They developed instructional activity by utilizing technology, and implemented this activity with students in their class. They also prepared a detailed lesson plan for these activities. These activities and lesson plans were also analyzed and evaluated in order to determine the type of technology used and the way teachers applied technology to their teaching methods while they were preparing learning environment. After prospective teachers presented their activities, they came together with their classmates in order to discuss their design, activities and instructional strategies. In this session, prospective computer teachers described their instructional strategies, the impact of technology on their activities and the way they would change their lesson plans in the future.

3.6.2.4. Validity and Reliability

Validity and reliability are two important issues in qualitative research studies in order to support persuasiveness of the results (Creswell, 1998). According to Creswell (1998), these concerns involve data collection, analysis and write-up process of a qualitative study. Creswell also explains eight major verification procedures in the qualitative study as in the followings:

1) Extended engagement and continual observation in the field
2) Triangulation: use of multiple and different sources, methods and investigations
3) Peer review or debriefing
4) Negative case analysis
5) Clarifying research bias
6) Member checks
7) Rich, thick description

8) External check (Cresswell, 1998)

In the current study, in order to provide reliability and validity, the following points were taken into account. First, triangulation was applied by using such data collection methods as interviews, observations and document analysis to confirm the evidence of the gathered evidence. Moreover, the interview and observation schedule were prepared by taking experts' reviews to ensure the validation. Besides, all interviews and observations were recorded with the consent of the interviewees. Indeed, all interviews were fully transcribed by the researcher. After that, transcriptions were showed to interviewees in order to check their views. Besides, coding system and codes of transcriptions were reviewed by the experts and peers. In conclusion, reliability and validity were taken into consideration in all processes of the research by the researcher.

3.7. Participants of the study

The purpose of the study is to understand the professional growth of the basic education computer teachers in terms of their perceptions and their competencies. Therefore, the population of the current study was preservice and inservice computer teachers who were students and/or who graduated from Computer Education and Instructional Technology (CEIT) departments in Turkey. Participants of this study consisted of 2nd (Sophomore), 3rd (Junior) and 4th (Senior) grade student teachers at the CEIT department and inservice teachers who were graduated from CEIT departments.

Data were collected from CEIT departments of the faculties of education in Turkey. CEIT departments were founded by the HEC in 1998 based on regulations of the faculties of education. The main aim of these departments is to educate computer and instructional technology teachers for K8 education. Students who graduated from CEIT departments serve as computer and technology teachers in K8 schools. There are 42 CEIT departments with newly opened departments in 2008 at universities in Turkey (OSYM, 2008). However, some of them have not started their academic education nor do they have 3rd or 4th grade students. The list of these departments can be seen in the in appendix H.

Questionnaires were sent by the researchers to those departments which included all grade students. Some of the departments were not willing to be participants of this study. Questionnaires were sent to 15 CEIT departments in different universities all over Turkey. Data were collected from these departments by taking permission of their university administrative board. The sample permission form can be seen in appendix I. Moreover, in these universities volunteer persons helped to distribute and collect data.

The following table shows the number of mailed and returned questionnaires from these 15 universities. As it is seen in the table, 1695 out of 2110 distributed questionnaires were returned. Fifteen schools which included 1695 participants represented the target population.

Table 3.1 P*articipants of the* Preservice *Teachers*

PROVINCE	UNIVERSITY	Distributed				Returned			
					TOTAL	YEAR			TOTAL
		2nd	3rd	4th		2nd	3rd	4th	
Eskişehir	Anadolu	70	70	60	200	54	38	60	152
Erzurum	Atatürk	35	35	30	100	27	28	26	81
Balıkesir	Balıkesir	70	70	60	200	52	57	58	167
Adana	Çukurova	50	50	50	150	34	46	42	122
Ankara	Gazi	40	40	35	115	41	33	23	97
Trabzon	KTU	50	50	40	140	45	39	35	119
Ankara	ODTU	45	40	45	130	40	33	44	117
Eskişehir	Osman Gazi	35	35	35	105	33	28	34	95
Konya	Selçuk	50	50	40	140	41	40	31	112
İstanbul	Yıldız Teknik	40	40	40	120	30	28	25	83
Ankara	Ankara	40	40	35	115	25	30	26	81
Ankara	Başkent	25	25	25	75	22	17	10	49
İstanbul	Marmara	50	50	50	150	43	36	46	125
Samsun	19 Mayıs	80	80	70	230	76	50	48	174
İzmir	Ege	50	50	40	140	45	43	33	121
Total	**15**	**730**	**725**	**655**	**2110**	**608**	**546**	**541**	**1695**

Preservice teachers as participants of the study consisted of 2nd, 3rd and 4th grade student teachers at the department of the CEIT. Moreover, inservice basic education teachers were also participants of this study. Data were collected from 104 inservice computer teachers who were graduated from CEIT departments. Participants of the inservice teachers were selected as a convenience sample. Fraenkel & Wallen (2000) emphasize that convenience sample consists of individuals who were conveniently available for the study. The researcher decided to collect data from inservice teachers in K8 schools in Ankara. In Ankara K8 schools included a broad perspective in terms of their socio economic status and the teachers graduated from different universities. Therefore, the convenience samples were considered to be representative of the population for all inservice computer teachers since these teachers were graduated from CEIT departments in different universities and they were also serving at various schools all over Ankara. K8 schools which are collected data can be seen in appendix J.

The researcher got permission from the MoNE to collect data from all K8 schools in Ankara, particularly from the ones which held computer teachers. This permission form can be seen in appendix K. After getting permission, the researcher visited both private and public schools in the districts of Ankara. There were no computer teachers in some K8 schools, although they had instructional technology laboratories. Moreover, some computer teachers were not graduated from CEIT departments. All computer teachers participated in the study voluntarily. As a conclusion, 64 computer teachers completed the survey; however, 14 of them were not graduated from CEIT departments. Besides these, the researcher sent the survey through e-mail to computer teachers who were graduated from CEIT departments and who wanted to participate in the study. 54 of them in total returned the questionnaire. These teachers were serving at K8 schools in different regions and provinces of Turkey. As a conclusion, of 104 inservice teachers, 50 were from Ankara and others were from the other provinces of Turkey.

Besides this survey, qualitative data were collected through interviews and observations from the participants. For this purpose, participants were chosen from preservice teachers by following these procedures:

1) Universities which located in Ankara were chosen as a convenience sample.
2) Fourth grade student teachers (seniors) were chosen since they had completed their teaching practices in schools.
3) Based on mixed method procedure, participants were determined according to quantitative results. Their demographics such as gender, high school and perceptions of teaching were taken in account to conduct the interviews and observations. According to Creswell et al. (2003), in the sequential explanatory design initial quantitative findings guide subsequent qualitative investigation.

Inservice teachers were chosen also according to the convenience sampling method. Their demographics such as gender, university and school locations which included the number of laboratories and the number of students were also taken into account while collecting data. Finally, 33 preservice computer teachers and 12 inservice teachers were chosen and interviewed. Additionally, their lesson plans were analyzed. Besides these, 8 preservice and 4 inservice classroom observations were conducted throughout data collection.

Since the results of this study can inform policy makers of the higher education and the MoNE about the needs of educators in the field of educational technology, the researcher decided to collect data within this broad perspective.

3.8. Data Collection Procedures

As recommended by Creswell (2003), in the mixed method, the study begins with a broad survey in order to generalize the results to a population, and in the second phase, it focuses on interviews and observations to collect detailed views of the participants. Phenomenological approaches are used in the second phase. Bogdan and Biklen (1998) state that in phenomenological strategies the philosophical perspectives behind the approach and the way people experience a phenomenon is investigated. The focus of this phase in the study was to explore experiences of preservice and inservice teachers while they practicing teaching.

Data were collected from both preservice and inservice basic education computer teachers. Such instruments as Teachers' Perception of Teaching (TPoT), technology integration factors, pedagogic and subject matter competencies were conducted after preservice teacher's "teaching practice" session in the second semester (2005-2006 spring). Prospective teachers were observed during their teaching practice. Moreover, their lesson plans were examined by document analysis. Meanwhile, data were collected from inservice basic education computer teachers who were graduated from computer education and instructional technology departments. Survey was also sent to basic education computer teachers throughout Turkey via mail and email by getting permission from the agency of MoNE. Therefore, cross-sectional comparison was possible between preservice and inservice teachers by multivariate analysis.

After quantitative data were collected, interviews were carried out with preservice and inservice teachers to deeply understand the differences between them during their teaching. Interviewees were selected according to participants' responses of the survey. Interviews were done separately with participants according to the results of the first phase, that is, the quantitative part of the study. The following table shows the timeline of the data collection procedures in the study.

Table 3.2 *Timeline of the Data Collection Procedures*

METHOD	INSTRUMENTS	PARTICIPANTS	DATA ANALYSIS
Quantitative	Teachers' perception of Teaching (TPoT), Technology integration factors, Pedagogic and subject matter competencies	2nd, 3rd and 4th grade students at departments of Computer Education and Instructional Technology (CEIT) students.	Descriptive statistics such as percentiles, frequencies, means etc. Multivariate analysis among groups
Qualitative (During Teaching practice)	Observations, Individual and focus group interviews, Document analysis	Preservice computer teachers (senior students) in CEIT departments	Qualitative data analysis techniques
Quantitative	Teachers' perception of Teaching (TPoT), Technology integration factors, Pedagogic and subject matter competencies	Inservice teachers who graduated from CEIT departments	Descriptive statistics such as percentiles, frequencies, means etc. Multivariate analysis
Qualitative	Interviews and observation	Inservice teachers who graduated from CEIT departments	Qualitative data analysis techniques

3.9. Data Analysis

This mixed method study mainly aims to display the current situations of the basic education computer teachers in terms of their professional growth. The data collected via the quantitative research were analyzed through descriptive and inferential statistics by using SPSS (Statistical Package for the Social Sciences) software.

In order to describe the basic characteristics of the collected data, descriptive statistics and techniques such as percentiles, frequency distributions, means and standart devisations etc. were used (Fraenkel & Wallen, 2000; Field, 2005; Trochim, 2000;). Descriptive statistics also provided simple summaries about the participants and the measures. Trochim (2000) explains that descriptive statistics are used to represent quantitative descriptions in a proper form. As there were in the research lots of measures and large numbers of people, descriptive statistics helped to interpret amounts of data in a manageable way. Moreover, by applying descriptive statistics, the researcher simply described what was there and what the data showed in order to understand computer teachers' professional growth throughout the years.

Inferential Statistics is used to investigate research questions, models and hypotheses to make inferences from collected data to more general conditions (Fraenkel & Wallen, 2000; Field, 2005; Green & Salkind, 2005; Trochim, 2000). In the current study, inferential statistics was used to make decision about the possibility of the observed differences among groups. In other words, inferential statistics was used to make inferences from collected data in terms of more general conditions, while descriptive statistics was used to describe on concerning the collected data. Inferential statistics comprise of the t-test, Analysis of Variance (ANOVA), Analysis of Covariance (ANCOVA), regression analysis, factor analysis, discriminant function analysis, and so on (Field, 2005; Rumsey, 2001; Trochim, 2001). As suggested by Trochim (2001), each of these inferential analyses is used to hold specific research questions, and in the current research, in order to answer the research questions (1-16) given in the introduction, descriptive and inferential statistics data analysis techniques were used to compare the average score between groups. For the inferential statistics, alpha level (α) was determined as $p=0.05$. Moreover, assumptions of the used statistical techniques for all analyses were checked.

The other research questions (from 11 to 17) were analyzed according to qualitative techniques. Bogdan & Biklen (1998) explain that there are three approaches in analyzing qualitative data, which are description, analysis, and interpretation. In the current study, the data collected through interviews, observations and document analysis were dependent on a content analysis and descriptive analysis to explore the patterns of the point of views and process. Firstly, interviews were transcribed as soon as they were done. Secondly, they were coded by depending on the research questions and based on Strauss and Corbin's coding strategies (Strauss & Corbin, 1998). Strauss and Corbin present three stages of data analysis, which are open coding, axial coding and selective coding.

Open coding was applied and interview transcripts were read carefully by the researcher in the current study. After that, codes were assigned to each meaningful phenomenon depending on particular interest of the research questions (Strauss & Corbin, 1998). In this stage, as many codes as possible were generated without considering the strong relevance to primarily established focus of the research. Moreover, specific themes were described from the observations, interviews, open-ended questionnaires as well as all documents.

In axial coding, Strauss and Corbin (1998) argue a researcher seeks for patterns by using specific incidences from the data to support the interpretation. In this study, the researcher tried to find patterns and trends about preservice and inservice computer teachers' views in terms of their perceptions of teaching and competencies by utilizing axial coding procedures.

On the other hand, the selective coding procedure, for Strauss and Corbin (1998), includes careful analysis of the patterns and trends after interpreting all the data and identifying the trends and themes. Therefore, the researcher in the current study reexamined all of the transcriptions and responses in order to accurately describe the phenomenon which had been identified at previous stages. During this classification procedure, analyses were carried on by seeking meaningful patterns in the data.

Since in the study there were multiple data sources, the data were complex and not easily comprehensible with standard measurable items. Therefore, all the qualitative data were analyzed in terms of the stages presented by Strauss and Corbin (1998). Observations and document analysis findings were done in the same manner. By utilizing these data analysis methods, an in-depth understanding of computer teachers' professional growth in terms of their perceptions and competencies was provided. At the end of data analysis, findings of this study were combined and compared to conclude the study.

3.10. Limitations of the Study

1) This study was limited to CEIT students and graduates in Turkey.
2) The validity was limited to the reliability of the used instruments.
3) Generalizibility was limited by the honesty of the participants' responses to instruments.
4) This study is limited by mixed method design and its lengthy time and feasibility of resources to collect and analyze both types of data (Ivankova et al., 2006).
5) Data were collected from 1695 preservice teacher all over Turkey. Actually, 97 participants were eliminated from the total collected data, due to missing data. This study was limited to the sample of 1598 preservice and 104 inservice basic education computer teachers all over Turkey.
6) As convenience sampling with representative methodologies was used to select K8 inservice computer teachers in both the quantitative and qualitative part of this study, the results of the study are limited to those participants.

3.11. Assumptions of the Study

1) Because 1598 preservice teachers participated in the study from all over Turkey in the 2005-2006 academic year, it was assumed that this number represents preservice computer teachers' population of Turkey.
2) Data were collected in this study cross-sectionally from sophomore, junior and senior student teachers and inservice teachers. Generally, the sections of each group were assumed to have shown similar characteristics.

3) The participants of this study were believed to have responded accurately and truthfully to all the measures used in the study.
4) The collected data were accurately recorded and analyzed.
5) Reliability and validity of all the measures used in the study were accurate enough to interpret the results.

3.12. Summary of the Chapter

This chapter addressed;

1) Research questions which highlight the research methodology and procedures.
2) Mixed method research was chosen as a research methodology and its rationale was explained.
3) Mixed method sequential explanatory design was mentioned as a research procedure.
4) Used instruments used in this study were explained. Why these instruments were used and how they were developed were touched upon.
5) Participants of the study were described.
6) Data collection procedures including how and when data was collected were explained.
7) How the collected data analyzed were explained
8) Validity and reliability issues were explained in the final part of this study.

CHAPTER 4

FINDINGS

4.1. Introduction

As mentioned before, the purpose of this study is to investigate the basic education computer teachers' professional growth in terms of their competencies, including pedagogic and subject matter competencies, and understand their perceptions of computer teaching and teaching in general. Using the methodology outlined in chapter 3, a large amount of data were gathered and analyzed in two phases: quantitative and qualitative through questionnaires as teachers' perception of teaching questionnaire, pedagogic competencies questionnaire, subject matter competency questionnaire and factors affecting technology integration questionnaire, and through such other data collection tools as interviews, observations and document analysis.

Because of the multiple data sources, the data were complex and not readily adaptable into standard measurable objects. The answers filled in the fully structured questionnaires that were used to collect data through quantitative techniques were transferred firstly to the digital environment. Then, the data collected from quantitative instruments were analyzed through descriptive and inferential statistics by utilizing SPSS software. In order to answer the research questions from 1 to10, quantitative data analysis techniques such as percentages, frequencies, means, variances, t test analysis, MANOVA analyses test were used.

Furthermore, the data collected by qualitative techniques were grouped and then reported with priority also including the observations and documents. Research questions from 11 to 17 were analyzed in terms of qualitative approach. Qualitative data were analyzed in the current study according to Strauss and Corbin's (1998) three stages of data analysis: (1) open coding; (2) axial coding; and (3) selective coding. In the present study, the basic point of the qualitative approach is to strengthen the quantitative findings and research process. Therefore, in this study there is a good evidence for the need to use the mixed method in which quantitative and qualitative techniques are used in an integrated manner.

4.2. Quantitative Results

This part of the chapter provides quantitative findings of the research responding to the research questions from 1 to 10. It starts with demographic information of the participants, and goes on with the findings of the instruments, including perceptions toward teaching and competencies according to participants' answers to these questionnaires. After that, inferential statistics results were presented.

4.2.1. Demographics

Demographic which refers to characteristics of the selected participants is important to understand the overall picture of the study. Therefore, in the study the descriptive information was collected by a short section in the survey. In this study, demographics included gender, age, and university, order of preference in university exam, secondary schooling, parents' education level and parents' occupation.

The Participants

As previously mentioned in the methodology section, participants of the study were consisted of 1568 preservice computer teachers varying from sophomores to seniors enrolled in the departments of Computer Education and Instructional Technology (CEIT) in 15 Turkish universities. Of 1695 returned data, 97 were eliminated from the total collected data due to missing data. Additionally, participants of this research were also 104 in-service computer teachers who graduated from CEIT departments. Detailed information about the participants of this research, including preservice and inservice teachers, is provided sequentially in Table 4.1 and Table 4.2.

Table 4.1 *Participants of the preservice computer teachers of the study*

		Year			Total	%
		2	**3**	**4**		
UNIVERSITY	19 Mayıs	76	45	43	164	10.5
	Başkent	17	14	7	38	2.4
	Anadolu	50	30	57	137	8.7
	Ankara	18	26	25	69	4.4
	Atatürk	23	25	24	72	4.6
	Balıkesir	46	55	58	159	10.1
	Çukurova	27	45	42	114	7.3
	Ege	40	41	33	114	7.3
	Gazi	40	30	20	90	5.7
	KTU	42	36	35	113	7.2
	Marmara	38	32	46	116	7.4
	ODTU	40	33	44	117	7.5
	OsmanGazi	32	26	34	92	5.9
	Selçuk	39	36	27	102	6.5
	YıldızTeknik	24	24	23	71	4.5
Total	**15**	**552**	**498**	**518**	**1568**	**100,0**

Table 4.2 *Participants of the inservice computer teachers of the study.*

		N	%
UNIVERSITY	19 Mayıs	5	4.8
	Anadolu	7	6.7
	Ankara	15	14.4
	Atatürk	3	2.9
	Balıkesir	3	2.9
	Çanakkale	2	1.9
	Çukurova	3	2.9
	Ege	2	1.9
	Gazi	19	18.3
	Hacettepe	8	7.7
	KTU	4	3.8

Table 4.2 (cont'd)

		N	%
UNIVERSITY	Marmara	3	2.9
	ODTU	18	17.3
	Osmangazi	2	1.9
	Selçuk	4	3.8
	Uludağ	1	1.0
	Missing	5	4.8
	Total	104	100.0

Gender

As seen in the table 3, 929 (59%) of preservice teachers were male and 638 (41%) were female, whereas 47% of inservice teachers were male, 53% were female.

Table 4.3 *Gender*

	Gender	N	%
Preservice	Male	929	59.2
	Female	638	40.7
	Total	1567	99.9
Inservice	Male	49	47.1
	Female	55	52.9
	Total	104	100

Other demographics of the participants

This section provides a broad picture of the participants of this research by introducing their age, order of preference, secondary schooling, parents' education level and occupations.

As Table 4.4 indicates, most of the preservice teachers age were ranged from 20-21 (41%) to 22-23 (42%).

The order of preferences, on the other hand, concerns the list of departments preservice teachers chose when they take the university entrance exam, where in the list of preferences computer teaching stands, and whether it is in the top of the list. The university entrance exam is highly competitive university admission system in Turkey. Each year approximately 1.5 million high school graduates take the exam, and according to their performance in multiple-choice tests, only 10% (ÖSYM, 2006) of them can enter the universities they prefer after they take the exam. Each high school graduate is given the chance to choose departments, and these choices reflect candidates' personal goals as well as their performance in the test. Students choose their department and profession preferences in numerical order according to the points they got from the university entrance exam. These preferences are classified in the current study in the following manner: first 5 choices are classified as 1, second 5 choices are classified 2 and others as 3.

According to the results of this study, as participants' order of preferences in the university entrance exam indicates, the departments the preservice teachers in this study mainly (55.16%, n= 865) attended were within their first five choices in the university entrance exam. This evidently illustrates their high motivation to get an admission to these departments. As for these preservice teachers' high school backgrounds, the secondary schooling experiences of the participants varied from general high school to science school. As it is shown in Table 4.4, 568 of the 1568 preservice teachers (36. 22 %) were graduated from Anatolian high schools and 510 of them (% 32.51) were graduated from vocational technical high schools.

Regarding their parents' educational background, of 1568 preservice teachers the mothers of 942 (60.1%) had only primary school degree and only 114 (7.3 %) had university degrees. When compared to mothers' education level, a difference is observed in educational backgrounds of their fathers. As shown in Table 4.4, 332 (21.2%) of fathers had university degree and 683 (43.6 %) of them did not continue their education after primary school. As for the occupations of these teachers' parents, the data illustrated that most mothers (74.7%, n=1172) were housewives, 7.7 % (120) of them were retired and 5.2% (82) of them were teachers. On the other hand, their fathers' occupation varied; 503 (32.51%) of them were retired, 276 (17.6%) of them were self-employed and 12.6% (198) of them were state employees.

Table 4.4 *Characteristic of the preservice computer teachers*

Characteristics	**N**	**(%)**	**Characteristics**	**N**	**(%)**
Age			***Secondary schooling***		
18-19	94	6	General High School	452	28,82
20-21	645	41.1	Anatolian High School	568	36,22
22-23	662	42.3	Vocational /Technical High School	278	17.72
24 and above	165	10.5	Anatolian Vocational /Technical High School	232	14.79
			Science High School	23	1.46
Order of preference			Other	15	.96
1-5	865	55.16			
6-10	361	23.02			
11 and above	342	21.81			
Mother's education			***Father's education***		
Primary school	942	60.1	Primary school	683	43.6
High school	260	16.6	High school	363	23.2
Higher Vocational School	48	3.1	Higher Vocational School	123	7.8
University	114	7.3	University	332	21.2
Post graduate	7	.4	Post graduate	33	2.1
None	196	12.5	None	33	2.1
Mothers' occupation			**Father's occupation**		
Self Employee	22	1.4	Self employee	276	17.6
Worker	27	1.7	Worker	173	11
Teacher	82	5.2	Teacher	198	12.6
State employee	40	2.6	State employee	200	12.8
Farmer	13	.8	Farmer	90	5.7
Retired	120	7.7	Retired	503	32.1
Other	89	5.7	Other	120	7.7
Housewife	1172	74.7			

The demographic data focusing on inservice teachers showed that the teaching experience of the inservice teachers participated in this research mainly ranged from 1 year to 4 years. Since the CEIT departments have a relatively short history in preparing computer teachers in Turkey, their graduates have been performing as teachers in the past six or 7 seven since 1998. As seen in Table 4.5, only 7.7 % (8 of 104) of them had been teachers more than 5 years in the schools. On the other hand, most of them (65 of 104), that is 62.5%, did not continue their education with graduate studies after their graduation. Only 32 of them (27%) were engaged in post graduate studies.

Educational level of the parents of inservice teachers showed similar pattern with their preservice counterparts. For example, 65 of the 104 inservice teachers' mothers (62.5%) had primary school degree. Only 11(10.6%) of them had higher education degrees. Besides, 24 (23.1%) of their fathers were university graduates while 38 (36.5%) of them left their education after primary school.

Similar to preservice teachers' mothers, 71 of inservice teachers' mothers were housewife (68.3%). On the other hand, their fathers' occupations varied from self-employee to farmer; however 38 (36.5%) of them were retired from their jobs. Detailed information about inservice computer teachers' characteristics can be seen in Table 4. 5.

Table 4.5 *Characteristic of the inservice teachers' participants*

Characteristics	**N**	**(%)**	**Characteristics**	**N**	**(%)**
Year of experience			***Post graduation***		
1	26	25	Master	24	23.1
2	30	28.8	PhD	4	3.8
3	24	23.1	None	65	62.5
4	12	11.5			
Other	8	7.7			
Mother's education			***Father's education***		
Primary school	65	62.5	Primary school	38	36.5
High school	12	11.5	High school	29	27.9

Table 4.5 (cont'd)

Characteristics	N	(%)	Characteristics	N	(%)
Mother's education			***Father's education***		
Post secondary	9	8.7	Post secondary	8	7.7
University	11	10.6	University	24	23.1
Post graduate	0	0	Post graduate	2	1.9
None (eg., Illiterate)	5	4.8	None (eg., Illiterate)	1	1.0
Mothers' occupation			***Father's occupation***		
Self Employment	4	3.8	Self employment	16	15,4
Worker	0	0	Worker	9	8.7
Teacher	9	8.7	Teacher	11	10.6
Civil Servant	6	5.8	Civil servant	16	5.4
Farmer	0	0	Farmer	5	4.8
Retired	12	11.5	Retired	38	36.5
Other			Other	8	7.7
Housewife	71	68.3			

4.2.2. Descriptive Statistics

4.2.2.1. Perception of Teaching

Prospective teachers were asked about their views in this section of the questionnaire via the Teachers Perception of Teaching (TPoT) instrument. Following table shows the participants' answers in the questionnaire.

Table 4.6 *Descriptive Statistics of the participants' perceptions towards teaching.*

ITEMS	Preservice		Inservice	
	M	*SD*	*M*	*SD*
Personal satisfaction with ICT as a profession				
1.Yeniden üniversite sınavına girsem bilgisayar öğretmenliğini yine seçerim.	3.38	1.21	3.30	1.32
2.Bilgisayar öğretimini eğlenceli bulurum	3.63	1.06	3.97	1.14
3)Bilgisayar öğretmenliği alanında özel bir yeteneğim olduğunu düşünüyorum	3.16	1.06	3.51	1.13
4)Bilgisayar öğretmenliği yapmak beni heyecanlandırıyor	3.16	1.09	3.41	1.21

Table 4.6 (cont'd)

ITEMS	Preservice *M*	Preservice *SD*	Inservice *M*	Inservice *SD*
5)Bilgisayar öğretmenliği benim karakterime uygun bir meslek değildir	3.45	1.28	3.77	1.20
6)Bilgisayar laboratuvarlarında ders anlatmak bana sıkıcı gelir	3.82	1.20	4.06	1.13
11)Meslek olarak bilgisayar öğretmenliği bana hiç cazip gelmiyor	3.76	1.23	3.71	1.32
General perceptions about the roles				
7)Bilgisayar öğretmenliğinin toplumda diğer öğretmenlere göre daha fazla saygı duyulan bir meslek olduğuna inanıyorum	3.30	1.14	2.94	1.24
8)Bilgisayar öğretmenini toplumun teknolojik bilgilerini geliştirmesine katkı sağlayan birisi olarak görüyorum	3.97	0.95	4.26	0.94
9)Diğer öğretmenlerin okulda bilgisayar öğretmenini kendilerine örnek aldıkları kanısındayım	2.85	1.04	2.82	1.16
10) Bilgisayar öğretmeninin öğrencilerin sosyal açıdan yaşamlarını farklılaştırdığına inanıyorum	3.42	1.02	3.72	0.99
12)Öğrencilerin bilgisayar öğretmenini okuldaki diğer öğretmenlerden daha fazla sevdikleri kanısındayım	3.46	1.03	3.87	1.00
13)Bilgisayar öğretmenlerinin öğrencilerin kültür seviyesini yükselttiğini düşünüyorum	3.48	0.98	3.86	1.00
14)Aranan ve seçkin bir meslek olma açısından bilgisayar öğretmenliğini diğer branşlara göre daha üstün olarak görüyorum	3.68	1.07	3.46	1.22
15) Bilgisayar öğretmenlerinin öğrencileri araştırmaya yönelterek daha başarılı bir öğrenci olmalarını sağladığını düşünüyorum	3.59	0.99	4.09	0.84
16)Bilgisayar öğretmenliğinin diğer branşlarla karşılaştırıldığında zor bir alan olduğuna inanıyorum	3.48	1.15	2.29	0.95

Based on preservice teachers' responses to TPoT, the 8th item in the survey (i.e., "Bilgisayar öğretmenini toplumun teknolojik bilgilerini geliştirmesine katkı sağlayan birisi olarak görüyorum") had the highest mean score (*M*=3.97, *SD*=0.95). The 6th item (i.e., "Bilgisayar laboratuvarlarında ders anlatmak bana sıkıcı gelir") had the second highest mean score, *M*=3.82, *SD*= 1.20). The least mean score of the prospective teachers was the item 9 which is "Diğer öğretmenlerin okulda bilgisayar öğretmenini kendilerine örnek aldıkları kanısındayım", *M*=2.85, *SD*=1.04).

Concerning inservice teachers' perceptions of teaching, while their responses to items were slightly different from those of preservice teachers, their responses illustrated some discrepancies. For example, they did not think that "Bilgisayar öğretmenliğinin diğer branşlarla karşılaştırıldığında zor bir alan olduğuna inanıyorum", (16^{th} item, M=2.29, SD= 0.95). For the same item, the mean score was 3.48 for preservice teachers. According to inservice teachers' responses, item 7 (i.e., Bilgisayar öğretmenliğinin toplumda diğer öğretmenlere göre daha fazla saygı duyulan bir meslek olduğuna inanıyorum" had the second least mean score ($M_{inservice}$ =2.94, $M_{preservice}$=3.30).

As for inservice teachers' responses to the items, the highest mean score was that of item 8 (i.e., Bilgisayar öğretmenini toplumun teknolojik bilgilerini geliştirmesine katkı sağlayan birisi olarak görüyorum, M=4.26, SD= 0.93). The 15^{th} item appeared to have the second highest mean score of the inservice teachers' answers (i.e., Bilgisayar öğretmenlerinin öğrencileri araştırmaya yönelterek daha başarılı bir öğrenci olmalarını sağladığını düşünüyorum, M= 4.09, SD=0.84).

4.2.2.2. Pedagogic and Subject Matter Competencies

Within the competency questionnaire, pedagogical and subject matter knowledge competencies were variables to be measured. As it has been mentioned in the earlier section, the pedagogical competency scale includes 22 items with three factors which are planning phase, teaching phase and evaluation phase and subject matter scale includes 23 items with three factors which are basic level, middle level and mastery level.

In the following table, mean scores of pedagogical competency items in each scale with their subscales are presented based on both preservice and inservice participations' responses.

Table 4.7 *Descriptive results of pedagogic competencies based on participants' answer*

ITEMS	Preservice M	Preservice SD	Inservice M	Inservice SD
PLANNING				
1) Ders plânında amaç, hedef ve davranışları açık biçimde ifade etme.	3.23	1.08	4.08	0.83
2) Ders plânındaki hedef ve davranışları gerçekleştirmeye yönelik öğrencileri güdüleyici öğrenme-öğretme etkinliklerini düzenleme	3.25	1.13	4.08	0.78
3) Plânlamada öğrenciler arasındaki bireysel farklılıkları ve öğrenme stillerini göz önünde bulundurma	3.16	1.17	3.96	0.91
4) Ders plânında bilgi ve iletişim teknolojilerinin nasıl kullanılacağına yer verme	3.32	1.21	4.34	0.76
5) Oturma düzenini öğrenci özelliklerine ve onların öğrenmelerini kolaylaştırabilecek biçimde düzenleme	3.30	1.26	4.20	0.75
6) Öğrencilerin farklı etkinlikler önermesine ve bunlara katılmasına olanak sağlama	3.32	1.29	4.23	0.78
7) Ders plânında yer alan konuyu, bütünlük sağlaması için önceki ve sonraki konularla ilişkilendirme	3.40	1.29	4.42	0.74
8) Öğrencilerin yaşlarına, önceki öğrenme düzeylerine ve yeteneklerine uygun yöntem ve tekniklerden yararlanma ve bunları kullanma	3.25	1.26	4.12	0.81
TEACHING				
9) Zamanı plânlı ve verimli biçimde kullanma	3.24	1.13	4.09	0.85
10) Öğrencilerin öğrendiklerini yaşamlarıyla ilişkilendirecek fırsatlar yaratma	3.28	1.20	4.20	0.81
11) Öğrencilerin katılımını sağlayacak etkinlikler (bireysel, ikili, grup çalışması, gösteri, gezi, gözlem, deney, panel vb) uygulama	3.32	1.26	4.05	1.05
12) Öğrencilerin düzeylerine uygun, konuya ilgilerini çekecek ve düşünmelerini sağlayacak biçimde farklı sorular sorma	3.39	1.16	4.31	0.74
13) Öğrencilerin kendilerini gerçekleştirmeleri için onlara sınıf içi ve dışında çeşitli etkinlikler ve olanaklar sunma	3.21	1.23	4.05	0.85
14) İşlenen dersi örneklendirerek, günlük yaşamla ilişkilendirebilme	3.41	1.23	4.40	0.75
15) Öğrencilerin derse karşı ilgisini çekme, onları güdüleme ve bunların sürekliliğini sağlama	3.39	1.20	4.21	0.79
20) Teknoloji destekli öğrenme ortamlarında davranış yönetimi için stratejiler geliştirme ve uygulama	3.15	1.11	4.00	0.93
21) Öğrencilerin düzeyine uygun sözel dili ve beden dilini etkili biçimde kullanma (duruş, mimikler, el, kol hareketleri, vb)	3.28	1.22	4.40	0.65
EVALUATION				
16) Öğrencileri değerlendirmek için amaca uygun ölçme aracı belirleme ve bunu kullanma	3.15	1.22	4.00	0.88
17) Ölçme aracının geçerlilik ve güvenirliliğini tespit etme	2.98	1.21	3.52	1.00
18) Bilgi ve iletişim teknolojilerini kullanarak verileri analiz etme	3.19	1.16	3.79	1.09
19) Ölçme sonuçlarını yorumlama ve öğrenciye geri bildirim verme	3.36	1.21	4.04	0.81
22) Öğrencileri dinleme, öğrencilerden gelen soru ve yanıtlara duyarlı olma.	3.64	1.27	4.68	0.52

In the pedagogic competencies, it was evident that in every item inservice teachers' competencies were higher than preservice teachers' scores. According to the information obtained from participants, the mean scores for the preservice teachers varied from 2.98 (e.g. item 17, Ölçme aracının geçerlilik ve güvenirliliğini tespit etme) to 3.64 (e.g. item 22, Öğrencileri dinleme, öğrencilerden gelen soru ve yanıtlara duyarlı olma). Inservice teachers' mean scores varied from 3.52 (e.g. item 17, Ölçme aracının geçerlilik ve güvenirliliğini tespit etme to 4.68 (e.g., item 22, Öğrencileri dinleme, öğrencilerden gelen soru ve yanıtlara duyarlı olma). Regarding to subject matter competencies, preservice and inservice computer teachers' responses were given following table;

Table 4.8 *Descriptive results of subject matter competencies*

ITEMS	**Preservice** *M*	*SD*	**Inservice** *M*	*SD*
BASIC				
1. Bilgisayara gerekli yazılımları kurma, sistemle ilgili ayarlamaları yapma ve gerektiğinde yazılımları güncelleme ve bilgisayardan kaldırma	4.12	1.04	4.64	0.60
2. Derslerde ve okulda ortaya çıkan-çıkabilecek yazılım ve donanım problemlerini çözecek stratejiler geliştirme	3.50	1.14	4.39	0.78
3. Sık kullanılan süreçleri otomatikleştirerek amaca uygun etkin yöntemler geliştirme. (hesap programlarında şablon, makrolar, kontrol yöntemleri, formüller ve hesaplamalar oluşturma)	3.50	1.10	4.35	0.84
5. İnternet uygulamalarını etkili bir şekilde kullanma. (telnet, internet tarayıcıları, dosya transfer protokolu, posta grupları, haber grupları, internet portalları ve araştırma motorları vs)	3.75	1.12	4.39	0.77
6. Yardımcı donanım birimlerini tanıtma, işlevlerini uygulamalı gösterme.(Tarayıcı, yazıcı, dijital fotoğraf makinesi vs.)	4.06	1.02	4.69	0.56
9. Öğrenenlerin çoklu ortamlar (metin, tablo, görüntü ve ses) tasarlamalarına yardımcı olacak stratejiler geliştirme	3.65	1.00	4.24	0.86
12. İletişim, problem çözme, düşünce ve fikirlerin sunumunda teknolojik araçlardan yararlanma. (tartışma grupları, chat, forum, yazı araçları, hesap tabloları çizim programları)	3.81	0.97	4.19	0.92
13. Kelime işlemciler, veritabanları, tablolama/hesaplama programları, hipermedia, web hazırlama, hareketli resim, grafik, masa üstü yayıncılık gibi uygulama programlarını kullanarak öğrenme materyalleri geliştirme	3.65	1.08	4.43	0.69
15. Öğrenci kayıtları için öğrenme yönetim sistemleri veya elektronik not verme programlarını kullanma	3.60	1.11	4.10	1.02
16. Öğrenenlerin farklı ortamları kullanarak bilgi paylaşmalarını sağlama (e-posta, sergi, poster, animasyon, ağ)	3.90	1.00	4.22	0.96

Table 4.8 (cont'd)

ITEMS	Preservice *M*	Preservice *SD*	Inservice *M*	Inservice *SD*
MIDDLE				
11. Öğrenme-öğretme amaçlı geliştirilmiş değişik araç ve içerik temelli yazılımları değerlendirme, seçme ve kullanma	3.63	0.97	4.21	0.75
14. Öğrenenlerin yaratıcılıklarını gelişmesine yardımcı olacak bilgi ve iletişim teknolojilerini kullanmalarını sağlama. (Bir görüntü üzerinde farklı renkleri deneme, bir serüven oyunu veya simülasyonu kullanma	3.62	1.03	4.08	0.98
19. Bilgi ve teknolojiyi kullanırken veri ve bilginin güvenliği, telif hakları ve gizlilik gibi teknoloji ile ilgili yasaları ve etik (ahlaki) kuralları bilme ve bunlara uygulama.	3.40	1.18	3.86	0.98
20. Mesleki gelişimini artırabilmek için diğer öğrenmelerle teknolojiyi kullanarak işbirliği yapma	3.67	0.97	4.33	0.84
21. Okulda ve toplumda teknolojiye eşit erişim ile ilgili süreçleri bilme ve uygulanmasında öncü olma	3.56	0.99	4.13	0.84
22. Öğrenenlerin teknoloji kullanımda olumlu sosyal ve ahlaki davranışlar göstermesini sağlama	3.82	0.91	4.38	0.75
23. Eğitim teknolojileri ve uygulamalarında güncel kalabilmek için internet, mesleki organizasyonlar, konferanslar, dergi ve gazete gibi kaynakları takip etme	3.80	1.01	4.31	0.80
MASTERY				
4. Uygun ağ kurma ve bunu kullanarak kurum içindeki bilgisayarların birbirleri ile haberleşmesini sağlama	3.06	1.29	3.82	1.22
7. Program öğrenme içeriği ile tutarlı, öğrenenlerin zekâ (çoklu zekâ) ve öğrenme stillerine uygun eğitsel yazılımlar tasarlama ve geliştirme	3.48	1.06	3.65	0.99
8. Bilgi sistemleri tasarlama, var olan sistemleri değerlendirme ve geliştirici önerilerde bulunma. (Bir web sitesi, LMS, veri tabanı hazırlama ve değerlendirme gibi)	3.34	1.16	3.66	1.04
10.Özel gereksinimli (fiziksel, zihinsel engelli) öğrenenlerin ihtiyaçlarına yönelik uygun teknolojilerin kullanımını içeren öğrenme etkinlikleri tasarlama	3.10	1.14	2.97	1.10
17. Öğrenenlerin, orijinal ürünler üretmesi, analiz, sentez ve yorumlama becerilerinin gelişmesine yardımcı olacak teknoloji temelli öğretme etkinlikleri planlama ve uygulama	3.41	1.00	3.90	1.10
18. Araştırma, bilgiye erişim ve bilgiyi paylaşma amacı ile mesleki portallar ve ERIC gibi veri tabanlarını kullanma	2.82	1.24	3.41	1.20

It can be understood from the information given by the participants that preservice teachers' mean scores ranged from 2.82 (e.g. item 18, Araştırma, bilgiye erişim ve bilgiyi paylaşma amacı ile mesleki portallar ve ERIC gibi veri tabanlarını kullanma) to

4.12 (item 1, Bilgisayara gerekli yazılımları kurma, sistemle ilgili ayarlamaları yapma ve gerektiğinde yazılımları güncelleme ve bilgisayardan kaldırma).

In the case for in service teachers, their mean scores were slightly different from the ones that preservice teachers illustrated. For example, the least mean score was that of item 10 (e.g. Özel gereksinimli (fiziksel, zihinsel engelli) öğrenenlerin ihtiyaçlarına yönelik uygun teknolojilerin kullanımını içeren öğrenme etkinlikleri tasarlama, *M*=2.97). Whereas, the highest mean score was that of item 6 (e.g. Yardımcı donanım birimlerini tanıtma, işlevlerini uygulamalı gösterme, tarayıcı, yazıcı, dijital fotoğraf makinesi vs., *M*= 4.69). Another significant finding from the participants' responses is that the mean scores of almost all the items were higher for the inservice teachers when compared to their preservice counterparts. However, only one item, item 10 (e.g. Özel gereksinimli (fiziksel, zihinsel engelli) öğrenenlerin ihtiyaçlarına yönelik uygun teknolojilerin kullanımını içeren öğrenme etkinlikleri tasarlama), was lower in the inservice teachers (*M*=3.10 in preservice, *M*= 2.97 inservice).

Mean Scores of Perceptions about Teaching and Competencies Based on Gender

Table 4.9 *Mean and standard deviations of genders of the participants in terms of perceptions and competencies*

		Preservice teachers			**Inservice teachers**		
Gender	**Variables**	*N*	*M*	*SD*	*N*	*M*	*SD*
Male	Perception of teaching	929	3.50	.61	49	3.71	.57
	Pedagogic competency	929	3.26	.88	49	4.13	.50
	Subject matter competency	927	3.73	.69	49	4.22	.53
Female	Perception of teaching	638	3.45	.58	55	3.44	.62
	Pedagogic competency	636	3.31	.91	55	4.15	.46
	Subject matter competency	634	3.35	.74	55	4.0	.57

Table 4.9 indicates that, male preservice teachers have higher scores (*M*= 3.50, *SD*= 0.61) than female preservice teachers have *M*= 3.45, *SD*= 0.58) in terms of perceptions about teaching. Similarly, male mean scores of the inservice teachers in terms of perception of teaching (*M*= 3.71, *SD*= 0.57) higher than female inservice teachers' (*M*= 3.44, *SD*= 0.62). On the other hand, in pedagogical competency, female preservice teachers' mean scores (*M*= 3.31, *SD*= 0.91) were higher than male preservice teachers' (*M*= 3.26, *SD*= 0.88). Concerning subject matter competency, male preservice teachers' mean scores (*M*= 3.73, *SD*= .69) were higher than female mean scores (*M*= 3.35, *SD*= .74). Regarding inservice teachers, both female and male inservice teachers' pedagogical competency mean scores are similar. On the other hand male inservice teachers have higher mean scores (*M*= 4.22, *SD*= .53) than female teachers have (*M*= 4.22, *SD*= .53) in terms of subject matter competencies.

Mean Scores of Perception about Teaching, Pedagogic and Subject Matter Competencies across Year

Table 4.10 *Descriptive Statistics for perception of teaching, pedagogic and subject matter competencies across years*

Variable	Year	*N*	*M*	*SD*
Perception of Teaching	2	546	3.50	.53
	3	498	3.33	.69
	4	516	3.59	.54
	Total	**1560**	**3.48**	**.60**
	inservice	104	3.56	.61
Pedagogical competencies	2	546	2.34	.49
	3	498	3.71	.61
	4	516	3.87	.55
	Total	**1560**	**3.28**	**.89**
	inservice	104	4.14	**.48**
Subject matter competencies	2	546	3.36	.76
	3	498	3.63	.73
	4	516	3.75	.65
	Total	**1560**	**3.58**	**.73**
	inservice	104	4.11	.56

Preservice and inservice teachers' perception of teaching and competency mean scores throughout years and standard deviation were given in the table 4.10. As it is seen in the above table, the mean score of sophomore (2nd year student teachers) perceptions of teaching (M=3.50) was higher than their counterparts in juniors' (3rd year) (M=3.33). However, the mean score of preservice teachers' perceptions on teaching got higher as their levels in college increased (M=3.59). As for the sums of the means, the sum of preservice teachers' perception (M=3.48) was less than inservice teachers' sums of the scores (M= 3.56). However, interestingly seniors' (4th year student teachers) perceptions towards teaching were higher than inservice teachers' perceptions (M_{senior}=3.59, $M_{inservice}$=3.56).

It is evident in the table 4.10 that preservice teachers' both pedagogic and subject matter competencies got higher across their years in their teacher education programs. In addition, inservice teachers feel more competent about pedagogic and subject matter knowledge than preservice teachers do.

Following figures display the mean plots about perception of teaching, pedagogic and subject matter competencies over the years.

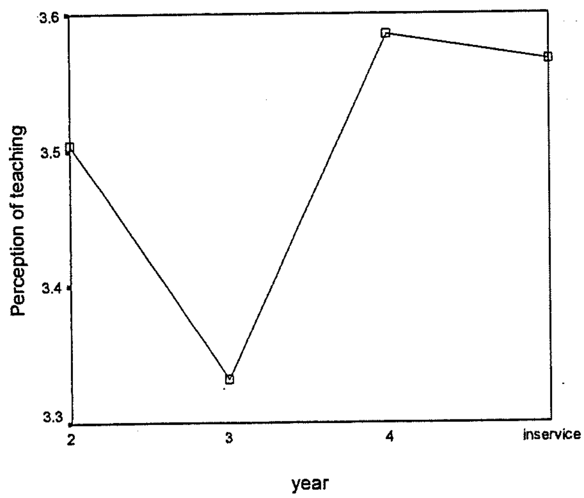

Figure 4.1 Mean plots about perceptions over the years

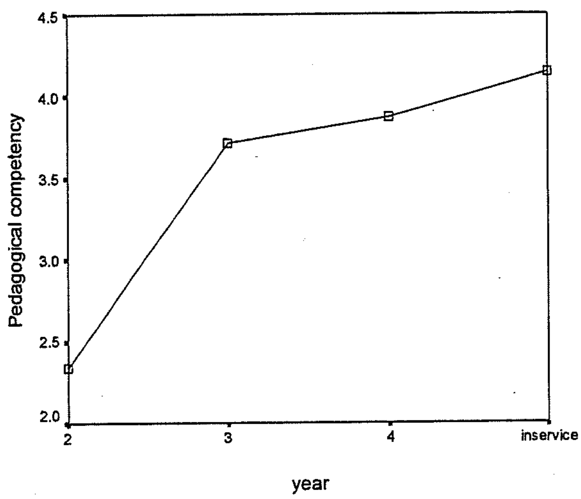

Figure 4.2 Mean plots about pedagogical competencies over the years

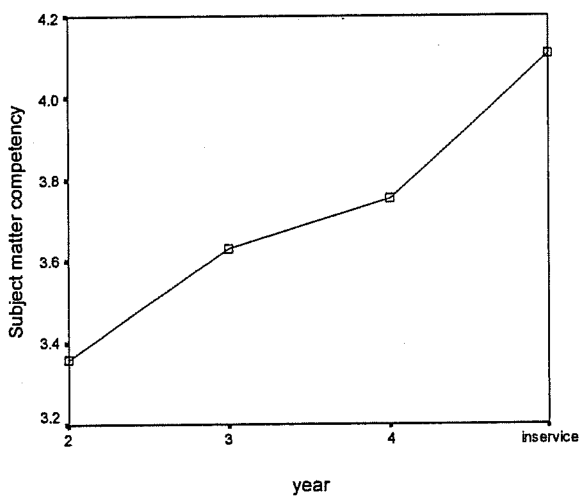

Figure 4.3 Mean plots about subject matter competencies over the years

Mean Scores of Perception about Teaching and Competencies about Pedagogic and Subject Matter Knowledge Based on the Preservice Teachers' High Schooling

The following table (table 4.11) shows preservice teachers' perceptions of teaching and their pedagogical and subject matter competencies according to their graduation of secondary school education.

Table 4.11 *Descriptive results of the secondary schooling in terms of perception of teaching and competencies*

	Secondary schooling	*N*	*M*	*SD*
Perceptions of Teaching	General	452	3.52	.56
	Anatolian	568	3.43	.59
	Vocational	278	3.55	.63
	Anatolian vocational Technical	232	3.49	.62
	Science school	23	3.29	.68
	Others	2	2.53	1.45
	Total	1555	3.48	.60
Pedagogical Competencies	General	451	3.29	.92
	Anatolian	567	3.15	.88
	Vocational	278	3.39	.88
	Anatolian vocational Technical	232	3.43	.84
	Science school	23	3.22	.89
	Others	2	3.27	1.67
	Total	1553	3.28	.89
Subject matter competencies	General	449	3.53	.71
	Anatolian	566	3.42	.73
	Vocational	277	3.82	.70
	Anatolian vocational Technical	232	3.76	.70
	Science school	23	3.63	.81
	Others	2	3.58	.83
	Total	1549	3.577	.732

Table 4.11 indicates that preservice teachers who graduated from vocational high school have the highest mean score (M=3.55, SD= .63) in terms of perception of teaching. Regarding pedagogical competencies, graduates from Anatolian vocational high school have the highest mean score (M=3.43, SD= .84) Moreover, It is obvious from the table that student teachers who graduated from vocational high school have higher mean scores (M=3.81, SD= .70) than the other student teachers in terms of subject matter competencies.

Mean Scores of Perception about Teaching and Competencies about Pedagogic and Subject Matter Knowledge Based on the Universities

Table 4.12 *Mean and standard deviations in terms of perception of teaching, pedagogical and subject matter competencies among universities.*

	UNIVERSITIES	*N*	*M*	*SD*
Perception of Teaching	Gazi	90	3.55	.57
	OsmanGazi	92	3.49	.59
	Atatürk	72	3.62	.55
	YıldızTeknik	71	3.61	.50
	Anadolu	137	3.49	.58
	Ankara	69	3.32	.60
	Balıkesir	159	3.71	.48
	Çukurova	114	3.38	.64
	KTU	113	3.49	.63
	Selçuk	102	3.69	.51
	Marmara	116	3.48	.49
	Başkent	38	3.76	.65
	ODTU	117	2.98	.70
	19 Mayıs	164	3.38	.57
	Ege	114	3.45	.52
	Total	**1568**	**3.48**	**.59**
Pedagogical competencies	Gazi	90	3.03	.86
	Osmangazi	92	3.24	.84
	Atatürk	72	3.45	.98
	YıldızTeknik	71	3.48	.85
	Anadolu	137	3.22	.96
	Ankara	69	3.30	.86
	Balıkesir	159	3.45	.81
	Çukurova	113	3.34	.87
	KTU	113	3.26	1.02
	Selçuk	102	3.22	.94
	Marmara	116	3.13	.95
	Başkent	37	2.90	1.15
	ODTU	117	3.30	.89
	19 Mayıs	164	3.10	.81
	Ege	114	3.57	.55
	Total	**1566**	**3.28**	**.89**

Table 4.12 (cont'd)

	UNIVERSITIES	*N*	*M*	*SD*
Subject matter Competencies	Gazi	90	3.49	.69
	Osmangazi	92	3.45	.77
	Atatürk	71	3.64	.74
	YıldızTeknik	70	3.69	.77
	Anadolu	137	3.59	.76
	Ankara	68	3,55	.69
	Balıkesir	159	3.57	.63
	Çukurova	114	3.46	.80
	KTU	111	3.55	.67
	Selçuk	102	3.49	.77
	Marmara	115	3.76	.63
	Başkent	38	3.77	.79
	ODTU	117	3.76	.65
	19 Mayıs	164	3.39	.85
	Ege	114	3.64	.69
	Total	**1562**	**3.57**	**.73**

As the above table indicates, the highest mean score of the preservice teachers' perception was observed in the students who were from Baskent university (*M*=3.76, *SD*=.65). Moreover, preservice teachers who were from Balikesir University held the second highest mean score (*M*=3.71, *SD* = .48). Interestingly, student teachers from METU illustrated the lowest mean score (*M*=2.98, *SD*=.70). Moreover, the second lowest score in this study was observed in the student teachers of Ankara University (M=3.32, SD=.60) in terms of these preservice teachers' perceptions towards teaching.

For pedagogical competency, student teachers who were from Ege University illustrated the highest mean score (*M*=3.57, *SD*=.55). The second highest mean score was observed in the preservice teachers from Yıldız Teknik University (*M*=3.48, *SD*= .85). On the other hand, Baskent university students had the lowest mean score (*M*=2.90, *SD*=1.15), and the second lowest score of pedagogical competency was observed in the preservice teachers from the Gazi University (*M*=3.03, *SD*=.86). On the other hand, with regard to subject matter competencies, preservice teachers from Baskent University show the highest mean score (M=3.77, SD=.79), and the second highest mean score students are from ODTU (METU) (M=3.76, SD = .65). Preservice teachers from 19 Mayis University had the lowest mean score (M=3.39, SD=.85), and the second lowest score was observed in the preservice teachers who were from Osman Gazi University (M=3.45, SD=.77. Besides, following figures display the mean plots about pedagogic and subject matter competencies among universities.

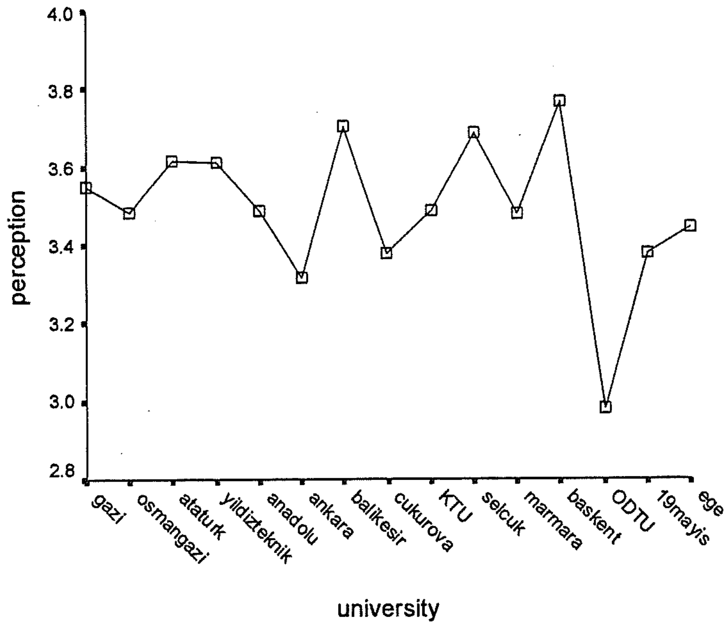

Figure 4.4 Mean plots about perceptions among universities

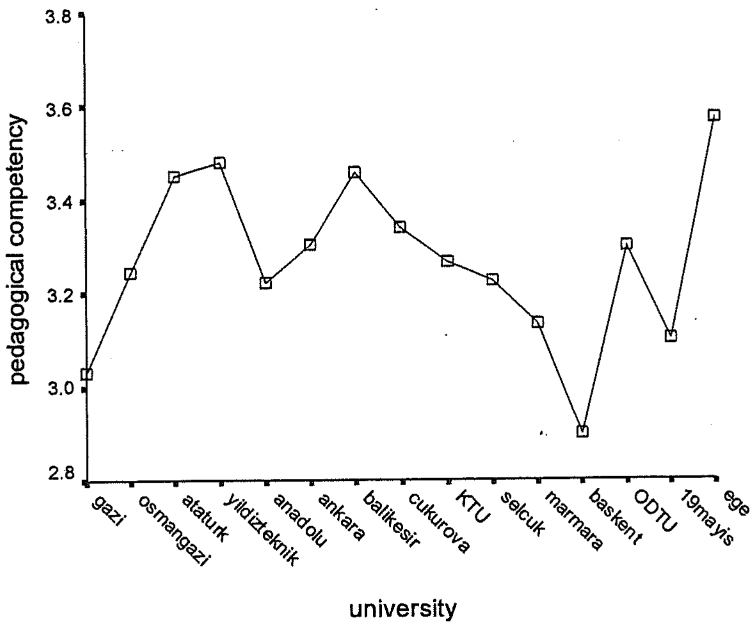

Figure 4.5 Mean plots about pedagogical competencies among universities

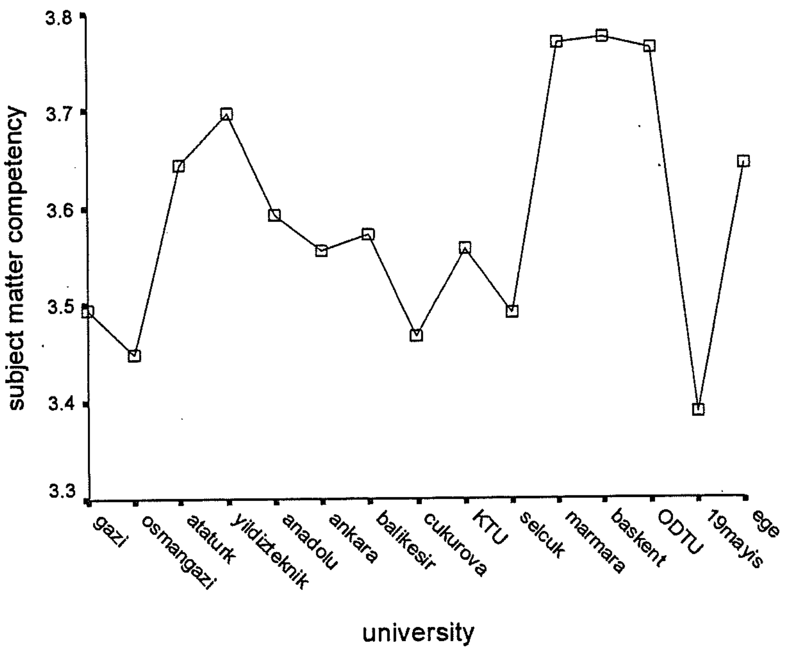

Figure 4.6 Mean plots about subject matter competencies among universities

4.2.2.3. Factors Affecting Technology Integration in Schools

To investigate basic education teachers' views toward technology integration and their thoughts about potential technology integration barriers, questionnaire which was prepared by the researcher was conducted in the present study. This part of the study reports preservice and inservice computer teachers' opinions on factors that contribute to successful technology integration. The following table (4.13) shows responses of the preservice and inservice teachers' opinion on factors contributing to successful technology integration in their teaching practices.

Table 4.13 *Descriptive results of technology integration barriers based on preservice and inservice teachers' participants' answers*

Items	**Preservice**		**Inservice**	
	M	*SD*	*M*	*SD*
1) Öğretmenin teknoloji bilgisi	4.38	.85	4.64	.62
2) Öğretmenin teknolojiye karşı tutumu	4.44	.77	4.74	.62
3) Teknik problemlerin çözülmesi	4.12	.92	4.59	.66
4) Öğretilecek konu-içerik	4.02	.91	4.45	.75
5) Kullanılan teknolojinin dersin hedeflerine göre seçilmesi	4.29	.90	4,56	.79
6) Kullanım sırasında teknik desteğin sağlanması	4.22	.88	4,54	.71
7) Okul idarecilerinin teknolojiye karşı tutumu	4.16	.95	4,60	.77
8) Öğrenme hedeflerinin belirlenmesi	4.00	.94	4,36	.72
9) Öğretmenin hangi konuda hangi teknolojik araç gereci kullanılacağına dair yeterli bilgiye sahip olması.	4.41	.82	4,52	.67
10) Kullanılan öğretim metodlarının öğrenci merkezli hale getirilmesi	4.12	.94	4,15	.92
11) Teknoloji uyarlanmış bir dersin sunumunda bir yardımcının olması	3.49	1.08	3,44	1.19
12) Teknolojik araç-gereçlerin kullanılmasına ilişkin öğretmenin aldığı hizmet öncesi dersler	3.98	.94	4,26	.87
13) Teknolojik araç gereçlerin kullanılmasına ilişkin öğretmenlere verilen hizmet içi eğitim	3.93	.97	4,12	.97
14) Öğretmenin teknoloji entegrasyonuna uygun ders planı hazırlaması	3.97	.97	4,23	.84
15) Sınıftaki öğrenci sayısı	4.08	1.05	4,62	.70
16) Bilgisayar laboratuvarlarına ve diğer teknolojik araç gereçlere erişim	4.36	.86	4,65	.64
17) Teknoloji tabanlı dersi uygularken yeterli zamanın sağlanması	4.25	.90	4,46	.76
18) Öğretmenin teknolojiyi kullanma becerisi	4.43	.80	4,59	.69
19) Derste kullanılacak teknolojinin çeşitliliği	4.09	.95	4,10	.93

Table 4.13 (cont'd)

Items	Preservice		Inservice	
	M	*SD*	*M*	*SD*
20) Öğrencinin teknolojiye karşı tutumu	4.23	.87	4,12	1.03
21) Öğrencinin teknoloji kullanma becerisi	3.99	.94	3,84	1.03
22) Öğrencilerin seviyeleri (1.sınıf, 2. sınıf, 3.sınıf vs.)	3.76	1.09	3,47	1.28
23) Okuldaki bilgisayar laboratuvarı ve bilgisayar sayısı	4.49	.87	4,59	.73
24) Sınıflarda teknolojik araç gereçlerin (Bilgisayar, tepegöz vs.) bulunması	4.43	.85	4,62	.61
25) Okullarda kullanılan yazılımların çeşitliliği	4.08	.94	4,19	.90
26) Velilerin teknoloji kullanımını desteklemesi	3.92	1.03	3,98	1.01
27) Teknolojik araç gereçlerin yeni ve kullanılabilir olması	4.28	.90	4,48	.75

According to preservice teachers' responses the 23rd item (e.g. Number of computers and labs in school) was perceived as the most important factor in technology integration (*M*=4.49, *SD*= .87). Another barrier was item 2 (*M*=4.44, *SD*=.77), which is Teachers' attitude towards technology". Student teachers identified that the least effective barrier for technology integration is item 22 (*M*=3.76, *SD*=1.09), which is "Students' levels (1st grade, 2nd grade, 3rd grade etc.)". Moreover, student teachers disagreed with "Parents' supporting using technology to use technology effectively in schools" (item 26, *M*=3.92, =.90).

Regarding inservice teachers' opinions about barriers to integrate technology, it is clearly seen that although their thoughts were slightly different from those of preservice teachers, they were more sensitive about technology integration barriers. For example, according to their answers, they generally agreed that almost all of the items hindered technology integration. The highest mean score was item 2 which is Teachers' attitude towards technology (M= 4.74, SD= .62). The other important factor was item 16 which is Accessing technological tools and computer labs (M=4.65, SD=.64). Although all items were important for them, some items had less mean score, and the least mean score was that of item 11, which is "Providing assistant while presenting a technology integrated lesson" (*M*=3.44, *SD*= 1.19). According to their answers, Students' abilities in using technology was one of the items that had the least effect for technology integration (*M*=3.84, *SD*=1.03).

Table 4.14 *Mean and standard deviations of the preservice and inservice teachers' opinions about technology integration factors*

	N	*M*	*SD*
Preservice	1567	4.144	.569
Inservice	104	4.330	.358

As for the sums of mean scores of these two groups' opinions about technology integration factors, inservice teachers' mean score (M= 4.33) was higher than preservice teachers' mean score (M= 4.14). This implies that when compared to their preservice counterparts, inservice teachers found these factors more important to integrate technology in their teaching practices.

4.2.3. Inferential statistics

4.2.3.1. Mean Differences in Preservice and Inservice Teachers' Perception of Teaching and Competencies over the Years

MANOVA was conducted to examine if there were significant differences among the variables which are perceptions and competencies of participants across years (sophomore=2nd year of student teachers, junior=3rd year of student teachers, senior=4th year of student teachers and inservice teachers). Before running MANOVA, assumptions of this analysis were checked. The following are the main assumptions that guided the analysis.

Missing Data: In this study, since missing data are less than 5%, there is no problem of the large data set to run MANOVA (Tabachnick & Fidell, 2001)

Interval/Ratio Scale on Dependent Variables: All dependent variables which are perceptions of teaching, pedagogical and subject matter competencies were measured with interval scales.

Multivariate Normality: Based on this assumption, the dependent variables are normally distributed for each of the populations as defined by the different levels of the factor. Tabachnick & Fidell (2001) assume that larger sample sizes may be required to produce relatively valid results. This assumption was provided in this study since there were more than 400 cases in each group. Moreover, values of the skewness and kurtosis are near to zero. Since skewness and kurtosis values ranged from (-1, +1], these values indicates that variables shows the normal distribution. In addition, histograms show normally distributed perception scores (Appendix L).

Outliers: When the data set was observed, there were not any significant outliers. Tabachnick and Fidell (2001) stressed that the outliers may not be deleted, if their deletion do not change the result. Therefore, in this study, the outliers were not deleted and the analysis continued with regarding outliers.

Homogeneity of Variance and Covariance Matrices: For the assumption of equality of covariance matrix for dependent variables Box's *M* test was used. It indicated that this assumption was not met, since there is a significant result, $p<.05$. Therefore, Pillai's criterion was used, since it is more robust than other analysis approach to deal with the homogeneity of variance-covariance matrices is violated (Tabachnick & Fidell, 2001).

Another assumption is the homogeneity of variances that assumes that the variances of the dependent variable are the same for all populations (Field, 2005). The results of the Levene's test was observed for this assumption whether the population variances for the two groups are equal.

Table 4.15 *Levene's Test of Equality of Error Variances*

	F	*df1*	*df2*	*Sig.*
Perception of teaching	7.585	7	1655	.000
Pedagogical competency	6.132	7	1655	.000
Subject matter competency	3.092	7	1655	.003

The values of p in the table of Levene's test were less than .05. This means that assumption of the homogeneity of variances was broken. However, it must be noted that failure to meet the assumption of homogeneity of variances is not fatal to run MANOVA, which is relatively robust, particularly when groups are of equal sample size (Glass, Peckham & Sanders, 1972; Field, 2005; Tabachnick & Fidell, 2001). When a sample size is large, small differences in the group variances can produce a Levene's test that is significant when the variances are not particularly different (Glass et al., 1972; Field, 2005; Trochim 2001). In this study, sample size was relatively large (n=1568), therefore the significance is not as important as its actual size (Field 2005; Hair et al., 1998; Tabachnick & Fidell, 2001)

After checking assumptions, MANOVA test was run. Based on results, a significant multivariate main effect for class status was found, Pillai's Trace = .68, F (9, 4965) = 160.21, p<.0125. Moreover, according to results, there was a significant result for gender, Pillai's Trace = .48, F (3, 1653) = 27.94, p<.001, that is gender has an effect on the dependent variables. On the other word, these significant results indicated that the effect of at least one of the groups on the set of dependent variables was different from the others. However, there was no significant interaction effect between independent variables which are gender and year, Pillai's Trace = .013, F (9, 4965) = 2.34, p>.05. Following table summarizes the results.

Table 4.16 *Multivariate and Univariate Analyses of Variance for perception of teaching and competencies in terms of gender and across year*

	MANOVA	ANOVA Perception of teaching	Pedagogical competency	Subject matter Competency
Gender	F (3, 1653) 27.94*	F (1, 1655) 576.11	F (1, 1655) 498.30	F (1, 1655) 660.16*
Year	F (9, 4965) 160.21*	F (3, 1665) 17.12*	F (3, 1665) 882.72*	F(3,1665) 55.94*
G*Y	F (9, 4965) 2.34			

*p<0.0125

Univariate analysis results indicated that there were significant differences in the perception of teaching across years; F (3, 1665) = 17.12, p<.001, η^2 = .03. This was a small difference, since it explained 3% of the variance in the perception scores. Moreover, univariate analysis result showed that there were significant differences throughout the years F (3, 1665) = 882.72, p<.001, η^2 = .63) in terms of pedagogic competencies as well as in terms of their subject matter competencies, F (3, 1665) = 55.94, p<.001, η^2 = .08). There was a large effect size in terms of pedagogical competencies (η^2 = .63), while there was a small effect size in terms of subject matter competencies (η^2 = .08). Regarding gender, according to univariate analysis, there was significant differences between gender in subject matter competencies, F (1, 1665) = 660.16, p<.001, η^2 = .04. This was a small difference since it explained 4% of the variance in the subject matter competency scores between genders.

Since univariate analysis for each dependent variable revealed significant results, follow up post hoc tests were conducted to evaluate pairwise differences among the means. Scheffe procedure which is the most conservative method to control Type 1 error (Hair et al., 1998) was used for comparisons. On the other hand, each comparison was tested at the alpha level of .0125.

The results show that there are significant differences in the preservice teachers' perceptions of teaching across years. In particular, there are significant differences between sophomores' perceptions of teaching and the juniors' perception of teaching on behalf of juniors (Mean difference =.17 and $p < .001$). In addition to that, preservice teachers' perceptions of computer teaching during their senior year in the program were more positive than those in the junior year (Mean difference =.26 and $p < .001$). However, there was not a significant difference between senior year and the sophomore year in the program in terms of perception of teaching (Mean difference =.085 and $p =$ .14). According to result, there was no statistically significance difference between senior student teachers and inservice teachers' perceptions toward teaching (Mean difference =.03 and $p >.05$).

For pedagogical competencies, there were significant differences among the different levels of groups. For example, there were statistically significant difference between sophomores and juniors in favor of juniors in terms of pedagogical competencies (mean difference=.1.37, $p < .001$). Moreover, there were statistically significant differences between sophomores and seniors in favor of seniors in terms of pedagogical competencies (mean difference=1.53, $p < .001$). Besides, there were statistically significant differences between juniors and seniors in favor of seniors (Mean difference =0.16 and $p =.001$). In addition, there was statistically significance difference between 4^{th} year students and inservice teachers' pedagogical competencies (Mean difference =.27 and $p >.001$)

Regarding subject matter competency, univariate analysis indicated there were significant differences in the means between the groups. For instance, there were statistically significant differences between sophomores and juniors in favor of junior in terms of subject matter competencies (mean difference=.28, $p <0.01$). Moreover, similar patterns were observed between sophomores and seniors in favor of seniors in terms of subject matter competencies (mean difference=.39, $p <0.01$). Besides, there were also statistically significant differences between juniors and seniors (Mean difference =.13

and p <0.01). Moreover, in the subject matter competency there was statistically significant difference between senior students and inservice teachers in favor of inservice teachers, (Mean difference =.35 and p <0.01).

Regarding gender differences, there were statistically differences between male preservice teachers and female preservice teachers' subject matter competencies in favor of male, (Mean difference =.37 and p <0.01).

4.2.3.2. Mean Differences in Preservice Teachers' Perceptions of Teaching and Competencies Based on their High Schools

In order to examine if there were significant differences among the variables which are perceptions and competencies of preservice teachers in their secondary schooling, MANOVA was conducted. Before running MANOVA, assumptions of this analysis were checked. It is seen that the assumptions of MANOVA which are independent observation, homogeneity of variance and covariance, and interval/ratio scale on dependent variables were met. In appendix M, it can be seen histograms for preservice teachers' perception of teaching and competencies based on their high school backgrounds. MANOVA results indicated that there was a significant multivariate main effect on dependent variables for secondary schooling, Pillai's Trace = .58, F (5, 4623) = 6.12, p<.001. The following table shows preservice teachers' perceptions and competencies according to their graduation of secondary school education.

Table 4.17 *Multivariate and Univariate Analyses of Variance for perception of teaching and competencies in terms of high schooling of the preservice teachers*

		ANOVA		
		Perception of teaching	Pedagogical competency	Subject matter Competency
	MANOVA			
Schooling	F (15, 4623) 6.12*	F (5, 1541) 3.18*	F (5, 1541) 4.66*	F(5,1541) 15.24*

*p<0.0125

Since there was a significant result on the multivariate analysis, univariate analysis was checked to examine differences on dependent variables. According to result of the univariate analysis, there was a significant difference among secondary schooling of the preservice teachers in terms of their perception of teaching, F (5, 1541) = 3.18, p<.001, η^2 = .01. However, there was a small effect, since it explained 1 % of the variance in perception of the teaching. Regarding competencies, univariate analysis result indicated that there were significant differences in the secondary schooling, F (5, 1542) = 4.66, p<.001, η^2 = .02) in terms of pedagogic competencies and F (5, 1541) = 15.24, p<.001, η^2 = .05) as well as in terms of their subject matter competencies. However, partial eta squared (η^2) indicated that these effects were small.

Since each dependent variable revealed significant results for the secondary schooling, post hoc test was run to examine differences. Scheffe procedure was used for pairwise comparisons at the alpha level of .01. Post hoc analysis shows that there were significant differences between preservice teachers who graduated from vocational high schools and graduated from Anatolian high schools in terms of perception in favor of vocational high schools' graduates. (Mean difference=0.12, p<0.01. Moreover, there were significant differences between graduates from Anatolian vocational technical high schools and from Anatolian high schools in terms of pedagogical competencies in favor of vocational technical high schools' graduates (Mean difference=0.28, p<0.01). Regarding subject matter competencies, preservice teachers who graduated from vocational high school were more competent than both general high school graduates (Mean difference=0.29, p<0.01) and Anatolian high school graduates (Mean difference=0.40, p<0.01)about pedagogical issues.

4.3. Qualitative Results

As it is aforementioned, this study investigates the professional growth of the basic education computer teachers in terms of perceptions of computer teaching and teaching in general, and their competencies (including pedagogical and subject matter). To that end, a large amount of data were gathered and analyzed in two phases, quantitative and qualitative, through teachers' perception of teaching questionnaire, pedagogic competencies questionnaire, subject matter competency questionnaire, factors affecting technology integration questionnaire, and such other data collection tools as interviews, observation and document analysis. In this part of the chapter, the qualitative findings obtained through interviews, observation and document analysis of the research responding to the research questions from 11 to 17 are presented. This part starts with preservice teachers' results and follows by those of inservice teachers.

4.3.1. Results with Preservice Teachers

In the second phase of the mixed methods research of this study, in order to deeply understand computer teachers' developments in terms of their perceptions of teaching, their competencies, and their field experiences that are affected with these variables, qualitative data were collected through interviews, observations and document analysis.

Structured interview questions and direct observation schedules were prepared in order to seek answers to the following research questions:

1) How are the preservice and inservice computer teachers' perceptions towards teaching?
2) How do preservice computer teachers apply their pedagogical and subject matter knowledge in their teaching practice?
3) How do inservice computer teachers apply their pedagogical and subject matter knowledge in their teaching practice?
4) Which factors (e.g., environmental and professional factors) do affect computer teachers' perceptions towards teaching?

5) How these factors (e.g., environmental and professional factors) do affect their teaching practices?
6) How preservice computer teachers' perceptions do affect their pedagogical and content knowledge during teaching activities?
7) How inservice computer teachers' perceptions do affect their pedagogical and content knowledge during teaching activities?

Structured interviews which are most frequently used by the qualitative researches (Briggs, 1986; Guba & Lincoln 1989; Marshal & Rossman, 1999; Patton, 1987; Yıldırım & Şimşek 2005) were conducted with participants. Interviews with 33 preservice teachers on the same items were implemented. Interviews were transcribed by the researcher as soon as they were completed. In order to analysis the interview transcriptions, the following strategies were used;

1) Open coding
2) Axial coding
3) Selective coding (Strauss & Corbin, 1998).

The same procedures were also used to analysis classroom observations. After using these strategies, themes and codes were extracted from participants' responses by taking into account the research questions under consideration. The table 4.18 shows these codes briefly.

Interview and observation schedules and procedures were prepared by the researcher focused on computer teachers' views and thoughts while they did teaching practice in schools. The convenience sample used for the selection of participants was based on the first phase of this mixed study. In other words, such factors as gender, high schooling, and perceptions were taken into account during the selection of the participants for the interviews and observations.

Interview questions started with initial questions to obtain information about the interviewee. 11 of 33 interviewees were from Middle East Technical university, 9 were from Ankara University, 7 from Gazi University and 6 from Baskent university. 18 of them were male, while 15 were female. 17 of them were graduated from vocational or Anatolian vocational technical high school, and 16 from general or Anatolian high school. Based on participants' opinions, although all of them believed that instructional technology was very important for teaching and learning activities, computer teachers have different roles from other teachers in integrating technology.

The following themes were extracted from participants' responses taking into account the research questions and using Strauss and Corbin's (1998) interview analysis strategies

Table 4.18 *Codes/themes after interview analysis.*

Codes/Themes	**Interview questions**	**Main research question**	**Sub- research question**
1) Perceptions • Perceptions about students' learning or roles (how students learn, what their reactions are. • Perceptions about teaching in general • Perceptions about computer teaching	1.,2.,3.,4., 10.	1	11 and 14
2) Competencies • Pedagogical competency • Subject matter competency	5., 6, 7.,8., 9	1. and 2.	12 and 15
3) Factors computer teaching influencing	11	2	14, 15 and 16
4) Satisfaction • Contextual satisfaction • Professional satisfaction	12.,13., general Initiative 5.	2	14, 15, 16 and 17

4.3.1.1. Perceptions of Teaching

Students' Attitudes towards Computer Course and Teachers

At the end of the interviews with the prospective teachers, it was evident that the behavior of the students in the classroom affected the prospective teachers' perception of the teaching profession. According to some prospective teachers (n= 12), during their practice teaching they noticed that the students were very interested in computer courses. They claimed that the students liked computer courses and thanks to this, they liked the computer teacher as well.

For instance, a female prospective teacher explained her ideas as follows:

> "I see that the students come to class with great pleasure and excitement. They compete to be the first ones at their computers. It seems to me that they like the computer courses very much, and this makes me very happy. Moreover, it is nice to see that they come to me and want to share what they have learnt recently in the course or somewhere else like the internet" [1].

10 prospective computer teachers stated that the students loved them because they had taught them how to reach supplementary resources for other courses.

For instance, one of the prospective teachers (a male graduate of an Anatolian high school) explained his opinions as follows:

> "...Internet covers plenty of things. You can find everything in the internet...We teach the students how to use the internet and how to reach the resources and this helps them to be more successful in their other courses...Thanks to this, the students adore us very much and they always like learning new and interesting things..." [2].

This situation was also seen during the classroom observations. For example, in one of the observed classes, students seemed happy and joyful throughout the course. This situation might be due to their positive attitudes towards computers, because they liked using computers.

However, some of the prospective teachers (n=8) asserted that the students were not interested in computer education at all, and they considered the computer course as a time for playing games. They also argued that some of the students ignored the computer course and the computer teacher because the computer course was not a compulsory course.

One prospective male teacher explains his views as in the following:

> "... The students consider the computer course a leisure activity, and they come to class just to play games and to chat with each other. Since the students do not have to worry about a grade for this course, they do not take the teacher seriously and despite whatever the teacher says, they behave how they want. This makes me very angry, but there is nothing I can do. I have to use other methods rather than threatening them about their grades like prohibiting them from playing computer games because grade is not important for them and they consider me as a bad teacher." [3].

Students loving computer games were also seen in classroom observations. In one of the observed classes, students were allowed to play computer games and surf the Internet after they finished the given tasks. Playing computer games and surfing the Internet were used by teacher as reinforcements.

Moreover, it is evident that student learning levels and computer knowledge greatly influence prospective teachers' opinions about the teaching profession. For instance, most of the prospective teachers (n=16) explicitly stated that they had the same experience when they were on their teaching practice.

The opinions of a prospective teacher, who graduated from a vocational high school for boys, are as follows:

"Some of the students know a lot about the computers whereas some of them have never seen a computer before. Due to this, it is hardly possible to help all the students equally. Moreover, if the class is crowded and there are not enough computers, the classroom atmosphere gets unbearable."[4].

The outdated curricula applied at K8 schools makes learning boring for students and teaching in these schools are not appealing for the prospective teachers. Most of the prospective teachers (n= 18) affirmed that the curricula at schools are out-of-date to catch up with the technology, which develops with great pace. They also thought that this caused them to teach the subjects what they already knew again and again, which made these students hate computer courses.

As an example, the opinions of a female prospective teacher, who is a graduate from Anatolian vocational high school, are as follows:

"We were supposed to teach 'what a mouse is and how the keyboard is used in the first week of our teaching practice, but the students already knew all that. I realize that they are very keen on learning about the technology, but it seems to me that when we become a teacher we cannot necessarily teach the way we would like to; however, there is more to technology than simply learning how to use a computer." [5].

Another male prospective teacher thinks like following:

"...The students are very young. We should ascertain each individual student's level of attainment and tailor that child's input accordingly. Their age levels and learning levels are different, and this makes things harder. When they come to the computer laboratory, they always want to use the internet and to play games..." [6]

Besides such negative situations, it is apparent that student interest and curiosity about computer and game technology (like internet and computer games) positively affects the prospective teachers' opinions of the teaching profession. The students admire their teachers since they think that the teachers know about all the progress in technology, and they are very keenly interested in this progress.

For instance, a female prospective teacher, who graduated from an Anatolian high school, thinks as follows:

> "...Whenever the students meet me outside, they come to me and tell me that they wonder if I know a particular thing or what a particular thing is and then they start telling me about new things they have learnt on the internet. Moreover, they ask me about things of which I have not heard before and this encourages me to follow the progress in technology."[7]

Another prospective teacher, who graduated from vocational high school for boys, explains his opinions as in the following:

> "...I always think that the students respect us more than they do other staff. They love us very much. We inform them about new technology, and they like this very much. Although they are very young, they are very interested in learning new things. This makes me feel that I am doing well in my profession."[8]

Twelve prospective teachers also thought that the computer courses provided students with a different environment. They stated that the students had the opportunity to see the visual riches in computer courses, which they had not seen in the other courses and attracted their attention very much.

For instance, a female prospective teacher, who graduated from a high school, reported:

> "...The students feel that when they come to the computer laboratory they are in a very different environment. They like the visual riches of the environment very much..." [9]

The General Perception about Teaching as a Profession

Although the prospective teachers gave different answers when they are asked about their opinions of the teaching profession, most of them (27) asserted that they did not think the same as they thought when they first attended the teaching profession department. They generally emphasized that although they were very excited and keen on teaching when they first attended the department, they lost this excitement and inclination.

For instance, a prospective teacher (METU, male, and a graduate of an Anatolian high school) expressed his opinions as:

> "I wanted to be a teacher very much when I was in my freshman year of college. It declined day by day, and now I do not want to be a teacher..." [10]

Another prospective teacher (METU, male and a graduate of an Anatolian vocational high school) declared his opinions as follows:

> "...I never think of being a teacher, and if I become a teacher, it will be because I have to. Everything is routine and teachers have to teach the same subject for one week. They also have to teach the same things every year. This profession does not suit me..."[11].

Prospective teachers (n= 18) confirmed that in the beginning they liked the teaching profession and they chose to attend this department voluntarily; however, at the moment they no longer liked the profession and thought if they had other work opportunities they would do another job.

For example a female prospective teacher (female and a graduate of an Anatolian high school) thought as follows:

> "...teaching profession was my first preference in the university entry exam, and I wanted to be a teacher very much. My parents are also teachers. However, my desire to be a teacher declined day by day. This way of teaching is not the teaching profession that I wished and dreamt about." [12]

Some other prospective teachers (14) stated that they liked the teaching profession very much; however, the conditions of the teachers were not good, and the teachers experienced economical problems. They thought that the teaching profession should be more appealing.

For instance, a female prospective teacher, who graduated from a vocational high school, asserts as:

> "I like teaching very much; however, the conditions of the teachers are very poor and I do not want to think if I will be able to live on my salary. I should think just about how to improve myself as a teacher."[13].

Many of the prospective teachers (19) asserted that they were not sure about what would happen in the future and they worried a lot about the KPSS (Public-Sector Selection Examination).

For instance, one prospective teacher (female and a graduated of vocational high school) thoughts as:

> "...to speak frankly, I am uncertain about the future, but I think I will be a teacher...We will take the KPSS, which is totally obscure in terms of what it covers, and, which includes subjects that are not related to our subject area. And I think this exam will not help us to be better teachers..." [14].

Besides these, some prospective teachers (n=16) clearly stated that they liked the teaching profession very much and chose to attend the department of teaching voluntarily.

For instance, a prospective teacher (male and a graduate from an occupational high school) explains his opinions as in the following:

> "...I like students and sharing my knowledge. I like to keep up-to-date and I am going to be a teacher. The teaching profession suits my personality exactly ..." [15]

General Perception about Computer Teaching as a Profession

When the prospective teachers were asked about their opinions of the computer teaching profession, they were observed to have both negative and positive views. 22 prospective teachers said that they found the computer teaching profession enjoyable and that they practiced teaching willingly.

To illustrate, a prospective teacher (male and a graduate of an Anatolian occupational high school) stated his opinions as follows:

> "...to me it is very enjoyable to tell the students about computers and technology and to teach these subjects to the students..." [16]

The opinions of another prospective teacher (female and a graduated from an Anatolian high school) are:

> "...We sometimes have difficulties and some discipline problems. Moreover, we get more tired in laboratory hours since we have to view the students' assignments on the computer. However, I think that it is nevertheless an enjoyable atmosphere because we are always engaged in something..." [17]

The prospective computer teachers (n= 12) emphasized that they were aware of the importance of informing people about the technological advances and thus of being useful to society, and they thought that they should act accordingly.

For instance, a prospective teacher (male and a graduated from an occupational high school) declared his opinions as:

> "...I think the more we adopt technology and the more we slavishly pursue every technological nuance, the more useful we will become to society. We should be self-sacrificed and distinct from the other people..." [18]

According to some prospective computer teachers (n=23), being a computer teacher was more advantageous than other subject areas. The commending factors can be summed up as follows: 1) computer courses have applications 2) technology and computers are taken as interdependent; and 3) the teachers have the opportunity to work in private companies.

For instance, the views of a prospective computer teacher (male and a graduate of vocational high school) were as follows:

> "...The computer teaching profession is a more enjoyable profession compared to the other subject areas. It has applications; it goes hand in

hand with technology, and the teachers can work in private companies as well..." [19].

The views of another prospective teacher (male and a graduate from an Anatolian vocational high school) were:

> "...Computer teaching profession is more appealing compared to the other subject areas. Technology is continually changing and if you keep up-to-date, you will never get bored. However, I worry about the opportunities we will have to pursue the technological advances when we become a teacher..." [20]

Besides these, many of the prospective computer teachers (26) considered the computer teaching profession not a difficult but quite an easy profession. According to them, taking so many courses at the university to become a computer teacher was not necessary.

For instance, a prospective teacher (female and a graduate from an occupational high school) thought:

> "...To me to become a computer teacher does not necessitate being much competent in fact, and I do not think that I will have difficulty while teaching..." [21].

Almost all the prospective computer teachers (28) asserted that the computer teachers were expected to undertake more than their specified responsibilities.

They stated their views about their experiences during their teaching practice as: (A prospective teacher, male and a graduate of an Anatolian high school)

> "...The staff of the schools expects us to do more than appear in our job description. We were not taught how to repair a computer or how to negotiate away the responsibility of repairing it. As I see the expectations of the staff, I realize that our job is more complicated than at first thought..." [22].

Some prospective teachers (n=10) complained that the computer teachers were made use of as technical service engineers, and worried about not being able to manage this job.

For example, a female and graduate of a general high school stated her opinion as:

> "...It seems that the job of the computer teachers at schools is more difficult than their specified responsibilities. To me it is not our job to mend the computers at schools or to sort out the problems of the computers of the school headmasters or of the other teachers. We did not attend university in order to do such things. At schools we are considered as technical services and this actually makes me feel frightened..." [23]

Another prospective teacher (female and a graduate of an Anatolian high school) explained her ideas as:

> "At schools we should not be expected to mend the computers of the teachers or the head teachers. We should instead think of better ways of to teach the students how to use the technology and we should help them understand the courses better. We should help the teachers to utilize the technology in their subject area."[24]

Half of the interviewed prospective computer teachers (n=17) emphasized that the computer teaching profession was nonsense and that the specified responsibilities of the computer teachers should be to teach the students how to use the computer and how to utilize computer technology in other subject areas instead of just telling the students about computers.

For instance, a prospective teacher (male, a graduate of an Anatolian high school and attending METU) stated his ideas as in the following:

> "...The term 'the computer teaching profession' sounds odd to me. I think it is better to call it the information technology teaching profession. We should teach the students how to use the computers instead of teaching them about the computers. Moreover, we should teach it to the teachers at school as well..." [25]

Another prospective teacher (Female and a graduate of an occupational high school) thought as following

> "I consider the computers as tools and I do not believe that the computer teaching profession is essential and crucial..." [26]

According to some prospective teachers' views (n=16), the teaching of computers by formator teachers who served in other subject areas also affects the attitudes of the students towards computer teachers.

For instance, one prospective teacher (male and a graduate of an occupational high school) stated:

> "...The teachers, who are qualified in other subject areas rather than in the subject area of computer teaching, undertake the job of the computer teachers. This sounds very absurd to me because they are neither educated nor qualified to do this. They do not consider it as their own job, and thus the students hate such teachers." [27]

Some prospective teachers (n=9) did not consider themselves as teachers of a specific subject area when they compared themselves to the other teachers.

For instance, a prospective teacher (male and a graduate of a high school) thought as follows:

> "I am confused about what I learn at school. I do not consider myself as a teacher of a specific subject area. Due to this, I sometimes would prefer to work in a private company. We have plenty of opportunities to work in the private sector. I may work at a special company..." [28]

Another prospective computer teacher (male and a graduate of an vocational high school) explained his ideas as:

> "...I will be a computer teacher, but not an information technology (IT) teacher. I cannot understand this...In fact I consider myself as an IT teacher...However, people generally do not consider the computer teachers as IT teachers..."[29].

Most prospective teachers (n=18) considered the computer teaching as an interdisciplinary subject area and emphasized that it should be interdependent with all courses. They also emphasized that the most important part of their job was not only to teach about the computers, but also to work cooperatively with the teachers from other subject areas.

For instance, a prospective teacher (male and a graduate of vocational high school) stated his ideas as in the following:

> "...To me our profession is an interdisciplinary subject area, so it should not be considered as the computer teaching profession...We should prepare materials for the other subject area courses or we should help the teachers do this...The technology should be utilized in every course, and we have a lot to do in order to carry out this aim..." [30]

Another prospective teacher (female and a graduate of an Anatolian high school) explained her opinions as in the following:

> "...We should meet the needs of the students. It is not enough just to say that this is a monitor or this is printer. They should also be given the opportunity to play games...Our profession is an interdisciplinary subject area...We should contribute to CAE. We should make use of it and we should also help the other teachers prepare materials for their courses." [31]

Another prospective teacher (male and a graduate of high school) thought:

> "We should help the computers be made use of in every course. The students are already familiar with the computers. It is nonsense to introduce them to the computers. Due to this, I do not like being considered as simply a computer teacher."[32]

4.3.1.2. Competencies

Pedagogical Competencies

When the prospective teachers were asked about their perceived pedagogical knowledge, they generally asserted they had some difficulties at practice although they consider themselves competent enough at the teaching profession. Prospective teachers were observed to have different ideas about preparing lesson plans and applying them. Some of them (n=14) considered lesson plans unnecessary for the computer lessons and found their application in computer labs very difficult.

For example, a prospective teacher (male and a graduate of an occupational high school) thought:

> "...I find preparing lesson plans useless, but I have to do it. However, I never follow the plan in practice. To me lesson plans are not very practical in the computer labs..." [33]

Some other prospective teachers (n=9) claimed that preparing lesson plans is very important and that lesson plans, which were prepared in accordance with the special needs of each individual in class, made the lessons abundantly productive.

To illustrate, one prospective teacher (female and attending an Anatolian high school) thought:

> "...I had prepared a detailed lesson plan before I came to class. Since I was acquainted with the students, I tried to provide the participation of the less-able students in the lesson while I was preparing my lesson plan. I tried to follow my lesson plan and it was really an enjoyable lesson..." [34]

Fourteen prospective teachers emphasized the importance of having a variety of materials in the lesson plans and giving examples to relate the topic under consideration in the lesson to the students' real life experiences

For instance, one prospective teacher thought:

> "...The students like computers very much and they want to know how to use them and when to make use of them. If we teach them how to use Excel, for instance, we should bring some samples that help them understand when they can make use of Excel. For example, I asked the students to prepare a shopping list, and they liked it very much..." [35]

Moreover, in the lesson plans, it was clearly seen that prospective teachers prepared plans diligently. They took in to consideration students' needs and they try to give many examples especially real life examples in their lesson plans.

The opinions of the prospective teachers about the lessons in the computer laboratories can be summed up as follows:

- Time is not enough.
- Time is limited.
- The teachers should communicate with the students effectively.
- The computer teachers should prepare teaching materials rather than just teaching about the computers.
- The designs of the classrooms are problematic.
- Classroom management is a challenge.

During the observation, preservice teachers were seen to be well-planned before the lesson. They arranged various materials such as handouts, PowerPoint slides and examples. However, it was observed that the teachers experienced a great deal of difficulty in implementing teaching strategies and techniques due to the number of students, individual differences of the students, and learning level of students.

The prospective teachers (n=6) argued that they could not implement teaching methods systematically while they taught and that computer courses were not suitable enough to do this.

A prospective teacher explained his opinions as:

> "Before starting a new topic, I give the students a quiz to determine the learning levels of the students. I do not decide the teaching method before coming to class, and then it is very difficult to follow the lesson plan. I try to make use of such teaching techniques as questioning or presentation, or I sometimes use a mix of the teaching methods and techniques." [36]

This situation was also observed during the classroom observations. Although prospective teachers gave importance to teaching methods in their lesson plans, they almost totally followed different ways and methods in their teaching practices.

The prospective teachers (n=7) emphasized the importance of drawing students' attention, and of keeping their motivation level high.

One prospective teacher asserted:

> "As soon as we understand that the students are getting bored, we should leave the topic of the lesson aside and tell them about something else. We should give real life examples to the topic of the lesson in order to attract the students' interest. Afterwards, we can continue studying the topic of the lesson." [37].

Another prospective teacher thought:

> "I pay special attention to the students, who are not interested in the lesson, and I provide them with a way to participate in the lesson. I realize that the attention of the students to the lesson sometimes declines. In such cases, we should find a way to attract their attention to the lesson. I let them even play games when necessary."[38]

Most of the prospective teachers (n=16) stressed that communication with the students is very important and that they should use different methods to provide effective communication. To them the teacher's communication with the students is more important in the computer labs since there is another object that attracts the students' attention in these places.

The prospective teachers explained their opinions of this topic as:

(Female and a graduate of an Anatolian high school),

> "...When the students come to the computer lab, they feel as if they come to another space. They want to behave freely since they do not have this chance in the other courses. They sometimes even forget the presence of the teacher in the class. Therefore, the teachers should provide effective communication with the students."[39]

During the classroom observations, students and teachers were observed to interact with each other a great deal. For example, in one class, a prospective teacher sometimes talked to students calling them with their names and did some jokes during the course.

These activities motivated students to the course. Therefore, it can be said that the communication between teacher and students was very good.

The prospective teacher (male and a graduate of an occupational school) argued difficulties about communication as follows:

> "...The students do not want to listen to the teacher when they come to the computer lab. Their only aim is to play computer games or to apply the knowledge they have learnt recently. However, we should provide good communication with them..."[40]

Almost all the prospective teachers (n= 28) highlighted that limited time was an important problem during the applications. The fact that the computer course is an optional course and its duration is limited to just one hour a week are other factors that negatively affect the success of the course and the accomplishment of the pedagogical requirements in the classroom.

The opinions of a prospective teacher (male and attending an Anatolian vocational high school) concerning the issue under focus are as follows:

> "...The duration for the computer course is only 1 hour. The settlement of the students on their places takes 15 minutes, and attracting their attention to the lesson takes another 15 minutes. The time left is not enough to teach what the teacher has planned."[41]

Moreover, the same problems were also observed during the observations. In one class, for example, though there was a certain interaction between the teacher and the students, the teacher sometimes warned the students who disturbed others. As observed, class interaction remained limited due to the high number of students in the class.

Most of the prospective teachers (n=18) also thought that they had difficulties in the evaluation part of the lesson and most of them saw time limitation as the main reason for that.

To exemplify, one prospective teacher (female, and attending an occupational high school) thought the following:

> "...I could hardly explain the topic I had planned to the students and I did not have time to get feedback from the students. If I had had time, I would have asked the students to apply what they learnt in order to check whether they really understood it or not."[42]

Another prospective teacher (male and a graduate of an Anatolian high school), who had a similar opinion, stated:

> "...I could not evaluate the students' knowledge about what I had taught. I do not know what would be better; giving the students a quiz or asking them to apply what they learnt. Actually, I did not have enough time. I promised the students that I would let them play computer games. They wanted to play games very much..." [43]

Some of the prospective teachers (n=8) emphasized that they did not know the evaluation criteria in the new curricula, and neither do they know how to apply the new curricula.

For instance, a female prospective teacher, who graduated from an Anatolian high school, thought as follows:

> "We are not familiar with the new curricula. In material development course, our teacher asked us to prepare materials by using flash because the curricula for science and technology course were renewed. I wish they taught us more about the new teaching methods...For instance, I have heard about the evaluation methods in the new curricula, but I do not have any idea about how to apply them. In fact I do not know if they are related to our subject area or not..." [44]

Difficulties of the students' assessments in the computer lab were also noticed in the classroom observations, although the assessment criteria were clearly explained in the lesson plans. For example, in one of the observed classes, after students finished their task, the teacher allowed some of them to explain their procedure of task and results. However, there was no time to do these activities for the students after the task.

Moreover, when the teacher gave homework about the task, almost all of the students complained about it.

Sixteen prospective teachers stressed that they sometimes had difficulties in classroom management/providing discipline in computer laboratories.

For instance, a prospective teacher (female and a graduate of a general high school) explained her opinions like this:

> "...The students come to the class with great excitement. They do not listen to us and they want to log on the computers and to play computer games. There emerges a very big noise and I have difficulty in providing silence. The students do not listen to us since they do not take exams in the computer course..." [45].

Another prospective teacher thought:

> "The students consider computer courses as a leisure time to play games. They are very noisy. I prefer punishing them so that they will not become naughty next time. I punish the children whom I cannot control otherwise, for instance, by asking them to clean their computers. I sometimes come up with new techniques to attain the students' attention and to prevent them from getting naughty..." [46]

Most of the prospective teachers (n= 13) found the duration of the teaching practice insufficient and they emphasized the necessity of extending their experience of teaching practice and the importance of holding discussions with their friends and mentor teachers just after their teaching practice.

A prospective teacher explained his opinions:

> "To me the duration for the teaching practice is not enough. We cannot do much in just one academic term. I wish the duration would be longer...I think it would be more useful for us if we had the opportunity to apply the methods or pedagogical knowledge we learn at university and to discuss the results after the application." [47].

Some prospective teachers (n=12] asserted that experience in teaching was very crucial and that they should be experienced in teaching before they started teaching at schools.

A prospective teacher thought:

> "...Our instructors always emphasize the importance of experience in teaching. I agree with them. However, I think we can have this experience before becoming a teacher...The duration for teaching practice, for instance, could be longer." [48]

Similar situations were also observed during the classroom observations. Preservice teachers sometimes faced difficulties in class management. For example, in one classroom, the teacher try to control over the class and the students did not paid attention to whatever she said. Students' hands were always up to answer the questions asked by the teacher. Moreover, still there were some movements around the classroom by the students, and some students at the back of the classroom constantly whispered among each other; but these were ignored by both the other students and the teacher.

Besides these, some of the prospective teachers (n=7) considered that the pedagogical courses at universities were very important and useful and that they should take some other courses about pedagogy.

As an example, a prospective teacher asserted:

> "...We are supposed to teach at primary schools, so we should take more pedagogical courses...I used to consider myself competent enough; however, I realize that I have some inadequacies...For instance, we should learn more about childhood psychology before we become teachers..." [49].

Another prospective teacher thought:

> "...We are supposed to teach about computers; however, there is another object between the teachers and the students –the computers. I have heard about human-computer interaction. I think we should take up a course like this to improve our communication with the students." [50].

Another female prospective teacher, who is a graduated of a high school, said;

> "…I always wonder about educational philosophy. I absolutely think we should take a course to learn about it." [51]

Competence in the Subject Matter Knowledge

The prospective teachers agreed (n=22) that they should always keep up-to-date in their subject area and that they should follow the progress in technology. Moreover, they thought that they take a much more advanced education than they are supposed to teach when they become teachers. Nevertheless, they thought that there was still much to learn about teaching and computer technology.

To illustrate, a prospective teacher (female and a graduate of an Anatolian high school) thought:

> "I do not consider myself technically competent enough. There is much more to learn about. However, as I said before, I know more than I need to teach at schools. However, I am aware of the fact that I always should keep up-to-date..."[52].

Another prospective teacher (male and a graduate from vocational high school) explained his opinions as:

> "...I consider myself competent enough to teach at a technical school, but we always should keep up-to-date. We should know about such programs as Flash and Dreamwaver."[53]

Some prospective teachers (n=16) affirmed that the level of the education at university was much less than they expected and that they already knew the things they were taught. They stated that they should have been taught up-to-date topics as well, or at least they should have been taught how to follow the progress in technology.

For example, one prospective teacher (male and a graduate of an occupational high school) asserted:

> "...The occupational courses we take up are Word and Excel, that is to say, they are at a very basic level. When I first attended the university, I thought that we would focus on subjects that are more technical. I have lost interest in my subject area over time. We learnt what they try to teach us at the university before attending the university. I am sure that most of the students we are supposed to teach know about Word and Excel. It would be better if they taught us more advanced topics..." [54]

Another prospective teacher (female and a graduate of an occupational high school):

> "...I am competent enough with the subjects of the computer course; however, we should always keep up-to-date because technology is changing continually. It is difficult to follow the progress in technology, but we have to do it. I think the curricula at schools are futile and they should be renewed..."[55]

Almost all of the prospective teachers (25) emphasized that the curricula of the computer course at schools should be renewed every year and kept up-to-date. They claimed that the curricula at schools are far behind the technology, which is continually developing, and thus the students cannot learn the progress in technology.

For instance, a prospective computer teacher (female and a graduate of an Anatolian occupational high school) stated her ideas as follows:

> "...I think we do not need much technical knowledge about the computers because we are going to become teachers. The curricula at schools are far behind the technology, which is continually developing. They should be revised and renewed if possible because the technology is developing with such a great pace that the students should learn the progress in technology to catch up with the technology. Most of the students already know the topics in the curricula and they want to learn new things."[56]

Apart from these, the prospective teachers (n=14) emphasized that their job is not only to teach about computers, but also to work cooperatively with the other teachers at school and to prepare teaching materials with them. They stressed that technology should be made use of in every subject area and that every course should be based on technology, especially on CAE.

A prospective teacher (male and a graduate of an Anatolian occupational high school) explained his opinions as:

> "...I do not think that it is accurate to consider us as just computer teachers. We should not only teach computers but also work cooperatively with the other teachers. The teachers should utilize technology in every course. I think we have a big responsibility to manage this aim."[57].

Another prospective teacher (female and a graduated from an Anatolian high school) thought:

> "...Our profession has also the educational technology dimension. I think this dimension should be taken into consideration more. We should give attention to CAE in our schools. We should always help the other teachers prepare teaching materials...To me we should be taught more about material development at university." [58]

Some of the prospective teachers (n=5) stressed that it was essential for them to have experience in private companies of educational technology in order to develop themselves. They thought that these companies followed the progress in technology better than they did and thus cooperating in such companies would help them have the opportunity to learn about the new software in these companies.

A prospective teacher (male and a graduate of an Anatolian vocational high school) explained his ideas as in the following:

> "...We should have experience in private IT companies as we do at schools...The private IT companies generate plenty of software. We can learn both about this software and how it is generated. Thus we can help the other teachers at our schools use this software."[59]

Some of the prospective teachers asserted (n=4) that it was essential for them to be able to generate software, and know to evaluate and to use them.

As an example, one prospective teacher (male and a gradute of vocational high school) thought as follows:

"...We find the technical courses we take at college very basic. We accept taking these courses; however, we think that it will be more useful for us if we were provided with the opportunity to take software courses in which we can generate software or evaluate them and we can learn how to use them..."[60]

The same situations were seen in the lesson plans. Moreover, it was observed during the class observations. It is clearly seen that preservice teachers were quite competent about what they teach about subject matter. The preservice teachers were well-prepared for the course. They were obviously knowledgeable about their topics. Throughout the course, teachers used several technological materials and teaching strategies.

4.3.1.3. The factors that Encourage/Discourage Computer Teachers to Work at Schools

All the prospective computer teachers thought that there were plenty of factors that influenced the teachers' decisions about working at schools. These factors can be summed up as follows:

- The number of the computers at schools
- The number of the computer laboratories and their usefulness
- The fact that the computer teachers are being made use of as technical services
- The students' attitudes towards and interest in computers
- The parents' attitudes towards the computer course/teachers
- The facts that the duration for computer courses is very limited, that the computer course is an optional course, and that the curricula for computer courses are old fashioned
- The salary of the teachers is very low.

Almost all of the prospective computer teachers (24) agreed that the number of the computer labs and scarcity of the computers or their ineffectiveness influenced the efficiency of the computer courses.

One prospective teacher (female and a graduate of an occupational high school) explained her ideas as follows:

> "...The number of the computers at schools is inefficient. 3 students have to share 1 computer and it affects the efficiency of our lessons..." [61]

Another prospective teacher thought:

> "In state schools 3 or 4 students have to share 1 computer whereas in private schools each student has 1 computer. Thus, the students in state schools cannot use the computers efficiently...To me the computer laboratories are not useful and they should be reorganized..." [62]

According to the prospective teachers (n=7), one of the leading factors that discouraged them to work at schools was the fact that they were considered as technical service staff.

For example, one of the prospective teachers (female and a graduated of vocational high school) expressed her opinion as follows:

> "...The computer teachers are considered as technical services at schools. All of the staff at schools expects the computer teachers to repair the computers...However, it is not our job to repair the computers...What should we do; repair the computers or focus on our lessons?"[63]

Another prospective teacher (female and a graduate of a general high school) explained her ideas as in the following:

> "The computer teachers should be distinct from the technical services. We were not educated to repair the computers of the school staff. Of course, we should help the teachers prepare materials for their lessons and we should help them utilize CAE in their courses; however, it is not our job to repair their personal computers..."[64]

Almost all of the prospective teachers (n=28) claimed that computer courses did not attract students' attentions since their duration was insufficient and they were optional. Inevitably, this situation negatively affected the performance of the computer teachers in their lessons.

For instance, one prospective teacher thought:

> "...The duration of the computer courses is very limited. The students do not worry about the grade for this course. They study for the LGS (high school entry exam) exam, and they consider computer courses as a leisure time for playing games...In fact, the computers are a good resource to get information. I wish they could realize the use of the computers to obtain information. However, the students are not aware of this situation, and the teachers do not encourage the students to use the computers as a source of information...What every individual teacher does is just to emphasize that their course is very important.".[65]

Most of the prospective teachers (n=17) supported that the attitudes of the school administrators towards technology is crucial for the efficiency of the computer courses.

For instance, one of the prospective teachers (male and a graduated of an Anatolian high school) explained his ideas as follows:

> "In one of the schools I attended for teaching practice, the headmaster of the school did not let the students' use the computer lab after the computer teacher went into his military service. The headmaster claimed that he was responsible for the computer lab and if the computers got broken, he would get accused for it. Therefore, the students could not use the computer lab. I was surprised to see that there are still such headmasters in schools."[66]

Moreover, the prospective computer teachers (n=11) argued that one of the leading factors that influenced the efficiency of the computer courses was the attitudes of the parents towards the computer course and teachers.

As an example, one of the prospective teachers stated as follows:

> "...Some of the parents do not give importance to the computer teachers. Moreover, some of them do not like computer teachers because the computer teachers let their children play computer games. Their only wish is to see that their children will be successful at school and in LGS. They do not worry about their children's computer or technology literacy. This situation naturally affects us very much..." [67]

Some of the prospective teachers asserted (n= 14) that the salary of the computer teachers is very low and this situation influences negatively the performance of the teachers in their lessons.

For instance, one of the prospective teachers explained his ideas as follows:

> "...The salary of the computer teachers is very low; in fact, it is the same case for all teachers from any subject area. I think their salary should be increased; otherwise, they will do such other jobs as mastering a web or working in an information processing center."[68]

The opinions of another prospective teacher were as follows:

> "I think the name of this profession should change. 'Computer teaching profession' may sound appealing; however, it is not the exact word for the specified work of the teachers." [69]

4.3.1.4. Satisfaction

The factors mentioned above, namely the factors that affect the computer teaching profession, also affect the satisfaction of the prospective teachers in their subject area. These factors can be categorized into two: 1) Environmental satisfaction and 2) professional satisfaction.

1) Environmental Satisfaction

Based on preservice teachers' views, environmental factors which are affected their satisfaction can be summed up as follows;

- The organization of the computer laboratory
- The number of computers
- The students' interest in the course
- The drawbacks of the computer labs
- The outdated curricula

2) Professional Satisfaction

- The indifference of the other teachers at schools
- The computer teachers' salary
- The difficulty of catching up with technology
- KPSS
- The opportunity to work in private sectors

Prospective computer teachers (n=13) stated that the disorganization of the computer laboratories affect their attitudes towards the computer teaching profession in a negative way.

For instance, the opinions of a prospective teacher (female and a graduate of a high school) were as follows:

> "...In the computer lab the computers are very close to each other in my teaching practice school. You can hardly breathe or walk around...After the students come into the lab, it is packed-out. The computer labs should be clean and wide enough for the teachers and the students to feel comfortable...Some computers are impaired and some are not usable in my school. .. computers are outdated in my lab this situation is discourage to me [70].

Almost all of the prospective teachers (n=25) complained about the outdated curricula. They stated that teaching the subjects according to an out-of-date curriculum was a nonsense and futile.

To illustrate, one of the prospective teachers (male and a graduate of an Anatolian vocational high school) explained his ideas as follows:

> "...To teach the students in accordance with the curricula at the schools is heart-rending. We did not expect to teach these things. I think that teaching the curricula at schools will not be good for the students and it is not what I expected to do..." [71].

Some of the prospective teachers stated that they chose to attend this department willingly, but their willingness and desire to work in the profession declined in time.

One of the prospective teachers thought:

> "I spent my first year at this department trying to adapt to the department. In the second year I started to recognize things. At the beginning, I was optimistic, but I lost my hope over time. Now I think that people do not need to attend the Computer Teaching Department in order to teach computer literacy..."[72].

The prospective teachers (n=12) criticized that computer teachers were paid very little and stated that their salary should be increased. They also asserted that if they were not paid more they would look for other job opportunities instead of teaching at schools.

One of the prospective teachers explained his ideas as follows:

> "...A few days ago I asked a teacher how much he was paid. I was shocked when I heard how much he earns. I used to think that they were paid more. I think the teachers cannot live on this salary. They earn less than I spend at university. From then on I started thinking of and searching for another job rather than becoming a teacher..."[73].

One of the negative sides of the computer teaching profession according to prospective teachers was the attitudes and thoughts of the teachers about them.

The prospective teachers asserted their ideas as follows:

> "Computer teachers are not happy. They just save the day. They should be able to catch up with the progress in technology...Moreover, the other teachers at schools should follow the technological progress related to their subject area and the computer teachers should help them... Technology change rapidly. We have to follow these developments. But I think that it is not easy and I am afraid of not to continuing" [74]

Most of the prospective teachers (n=19) thought that KPSS affected them in a very negative way. They also thought that this exam should be cancelled or it should consist of questions that are related to their profession.

One of the prospective teachers explained his ideas as:

> "I cannot understand the reason for KPSS. I always dream about the exam. It is nonsense. They employ teachers according to the result of this exam. What about the education we got for four years? Then we do not need to attend university, and they should let us study for this exam after we graduate from the high school. To me this exam is very absurd…"[75]

Another prospective teacher thought:

> "I admit to the need to take the exam; however, it should consist of questions in our subject area and we should be employed according to the results of this kind of an exam…This is my last year at university and the only thing I do is study for the exam…"[76]

Some preservice teachers (n=4) mentioned about the possibility of their finding a job other than teaching.

One of the prospective teachers said that:

> ".. actually I sometimes think that our profession is not satisfied me. opportunities to get a job other sectors are getting me attracting to think different professions." [77].

Table 4.19 *Summary of the interviews with preservice teachers*

Theme	Code	Sub code	N	Example quotations
Perceptions	**1.1 Students attitudes towards computer course and Teachers**	Students' interest about computer courses and teachers	12	..I see that the students come to class with **great pleasure and excitement** It seems to me that **students like the computer courses very much,** and this makes me happy.
		supplementary resources for the other courses for the students	10	We teach the students how to use the internet and **how to reach the resources** and this helps them to be more successful in their other courses.
		Students consider the computer course as a time for playing games	8	..and they come to class just to **play games** and to chat with each other
		Students' learning levels and computer knowledge	16	Some of the students **know a lot about the computers** whereas some of them have never seen a computer before ...this makes me **complicated**
		students are bored with repeated curricula	18	We were supposed to teach what a mouse is and how the keyboard is used in the our teaching practice **again and again, but the students already knew all that**
		Students admire their teachers	14	Students ask me about things of which I have not heard before and **this encourages** me to follow the progress in technologyI always think that the students **respect us more than they do other staff.** They love us
		The computer courses provide students with a different environment	12	The students feel that when they come to the computer laboratory they are in a very different environment. **They like the visual riches**

Table 4.19 (cont'd)

Theme	Code	Sub_code	N	Example quotations
	1.2 General perception about teaching as a profession	preservice teachers lost their excitements and inclinations	27	I **wanted to be a teacher very much** when I was in my freshman year of college. It **declined day by day**, and now I do not want to be a teacher ..I never think of being a teacher, and if I become a teacher, it will be because I have to.
		Willing to work another job instead of teaching	18	This way of teaching **is not the teaching profession** that I wished and dreamt about.
		The conditions of the teachers are not good	14	the conditions of the teachers **are very poor** and I do not want to think if I will be able to live on **my salary**
		Worrying a lot about the KPSS and their future career.	19	We will take the **KPSS, which is totally obscure** in terms of what it covers, and, which includes subjects that are not related to our subject area
		Choosing to attend this department voluntarily and sharing knowledge	16	I like students and **sharing my knowledge.** I like to keep up-to-date and I am going to be a teacher. The teaching profession **suits my personality** exactly
	1.3 General perception about computer teaching as a profession	The computer teaching profession is enjoyable	22	To me it is **very enjoyable** to tell the students about computers and technology and to teach these subjects to the students...
		Being useful to society	12	I think the more we adopt technology and the more we slavishly pursue every technological nuance, **the more useful we will become to society**
		Opportunities for working other companies	23	It has applications; it goes hand in hand with technology, and the I can work in private companies as well

Table 4.19 (cont'd)

Theme	Code	Sub code	N	Example quotations
		Computer teaching as a profession is quite an easy profession.	26	To me to become a computer teacher does not necessitate being much competent in fact, and I **do not think** that **I will have difficulty while teaching**
		There are more expectations from computer teachers	28	The staff of the **schools expects us to do more** than appear in our job description. We **were not taught how to repair** a computer or how to negotiate away the responsibility of repairing it.
		computer teachers are made use of as technical service staff	10	To me it is **not our job to mend the computers** at schools or to sort out the problems of the computers of the school headmasters or of the other teachers
		The computer teaching profession is nonsense	17	The term 'the computer teaching profession' **sounds odd to me.** I consider the computers as tools and **I do not believe** that the computer teaching profession is **essential and crucial**
		Formator teachers influence their job	16	This sounds very absurd to me because **they are neither educated nor qualified to do this**. They do not consider it as their own job, and thus the **students hate such teachers**
		Indifferences with other subject areas teachers	9	I am confused about what I learn at school. I do not consider myself as a teacher of a specific subject area. "...I will be a computer teacher, but not an information technology (IT) teacher. I **cannot understand** this.
		Computer teaching is an interdisciplinary subject area	18	To me our profession is an **interdisciplinary subject area**, so it should not be considered as the computer teaching profession.

Table 4.19 (cont'd)

Theme	Code	Sub code	N	Example quotations
				We should make use of it and we should also help the **other teachers prepare materials** for their courses
2.Competencies	2.1 Pedagogic competencies	Considering lesson plans unnecessary for the computer lessons	14	I find preparing lesson plans useless, I **never follow the plan** in practice. To me lesson plans are not very practical in the computer labs.
		Preparing lesson plans in accordance with individual differences in class.	9	Since I was acquainted with the students, I tried to provide the **participation of the less-able students** in the lesson while I was preparing my lesson pan
		Giving real-life examples relating the topic and having a variety of materials in the lesson plans.	14	I asked the students **to prepare a shopping list,** and they liked it very much If we teach them how to use Excel, for instance, we should bring **some samples that help them understand** when they can make use of Excel
		Following the teaching methods systematically is difficult	6	I do not decide the teaching method before coming to class, and then **it is very difficult to follow** the lesson plan
		Attaining the attention of the students, and of keeping their motivation	7	The students are getting bored, we should leave the topic of the lesson aside and tell **them about something else** **I pay special attention** to the students, who are not interested in the lesson, and I provide them with a way to participate in the lesson.
		Teacher communication with the students is quite important.	16	When the students come to the lab, they feel as if they come to another space. Therefore, the teachers should provide **effective communication** with the students during the lesson

Table 4.19 (cont'd)

Theme	Code	Sub_code	N	Example Quotations
		Time limitation affect the pedagogical requirements in the class	28	The duration for the computer course is only 1 hour. The settlement of the students on their places takes 15 minutes, and attracting their attention to the lesson takes another 15 minutes. **The time left is not enough**
		Difficulties in the evaluation part of the lesson.	18	I could hardly explain the topic I had planned to the students and I **did not have time to get feedback from the students.** If I had had time, I **would have asked the students to apply what they learnt** in order to check whether they really understood it or not
		Confusions about the new curricula especially its evaluation criteria in basic schools.	8	We are not familiar with **the new curricula.** I wish they taught us more about the new teaching methods. I have heard about the **evaluation methods** in the new curricula, but I **do not have any idea about** how to apply them to our subject area
		Classroom management/providing discipline in computer laboratories	16	The students come to the class with **great excitement**. They do not listen to us and they want to log on the computers and to play computer games. They are **very noisy**
		The duration of the teaching practice time in the schools	13	I wish the duration would **be longer**... I think it would be more useful for us if we had the opportunity to apply the **methods or pedagogical knowledge we learn at university and to discuss the results** after the application
		Experience in teaching is important	12	Our instructors always emphasize the **importance of experience** in teaching. I agree with them. However, I think we can have this experience before becoming a teacher.

Table 4.19 (cont'd)

Theme	Code	Sub_code	N	Example quatations
		More pedagogical courses are needed during the training.	7	We are supposed to teach at primary schools, so we should take **more pedagogical courses**....For instance, we should learn more **about childhood psychology and educational philosophy** before we become teachers.
		The level of the education at university is not enough.	16	Word and Excel, that is to say, they are at a **very basic level**. When I first attended the university, I thought that we would **focus on more technical subjects**. I have lost interest in my subject area over time
		The curricula of the computer course is out of date.	25	I think we **do not need much technical knowledge** about the computers because we are going to become teachers. The **curricula** at schools are **far behind the technology**, which is continually developing. They should be revised and renewed if possible.
		Working cooperatively with the teachers at school and preparing teaching materials with them.	14	I do not think that it is accurate to consider us as just computer teachers. We should not only teach computers but also **work cooperatively** with the other teachers…We should always **help** the other teachers prepare teaching **materials**
		Having experiences in private companies of educational technology.	5	The private **IT companies** generate plenty of software. We can learn both **about software and how it is generated**. Thus we can help the other teachers at our schools use this software
		Preparing, developing, evaluating and using educational software.	4	We took the **technical courses** at very basic. However, I think that it would be more useful for us if we were provided with the opportunity to take software courses in which we can **develop** software or **evaluate** them and we can learn how to **use** them

Table 4.19 (cont'd)

Theme	Code	Sub_code	N	Example quotations
3.The factors that encourage/discourage computer teachers to work at schools	**Plenty of factors that influence the teachers' decisions about working at schools.**	Number of the computer labs and scarcity of the computers.	24	**3 students** have to **share 1 computer** and it affects the efficiency my lessons. Thus, the students cannot use the **computers efficiently**
		Considering as a technical staff in schools.	7	All of the staff at schools **expects the computer teachers to repair** the computers as technical services. However, it is not our job to repair the computers. We were not educated to repair the computers of the school staff.
		The duration of computer courses and being optional of the computer courses	28	The **duration** of the computer courses is **very limited**. The students **do not worry about the grade** for this course. ...and the teachers do not encourage the students to use the computers as a source of information...What every individual teacher does is just to emphasize that their course is very important
		The attitudes of the school administrators towards technology is essential	17	In one of the schools I attended for teaching practice, the **principal of the school did not let the students' use the computer lab** after the computer teacher went into his military service.
		The attitudes of the parents towards the computer course and teachers are important	11	Some of the **parents do not give importance to the computer** courses and teachers. Moreover, some of them **do not like** computer teachers because the computer teachers let their children play computer games
		The salary of the computer teachers is low.	14	For me the **salary of the computer teachers is very low**. I think their salary **should be increased**; otherwise, they will do such other jobs as mastering a web or working.

Table 4.19 (cont'd)

Theme	Code	Sub_Code	N	Example quotations
Satisfaction	**Environmental satisfaction**	The organization of the computer laboratory	13	In my teaching practice school in the **computer lab the computers are very close to each other**. You can hardly breathe or walk around.
		The number of computers in class	24	The **number** of the computers at schools **is inefficient** After the students come into the lab, it `is packed-out
		The students' interest in the course	16	I see that the students come to class with **great pleasure and excitement.** This makes me **happy**
		The drawbacks of the computer labs	6	Some computers are impaired and some are not usable in my school. .. computers are outdated in my lab this situation is discourage to me
		The outdated curricula	25	I think that teaching the curricula at schools will not be good for the students and it is not what I expected to do
	Professional satisfaction	The indifferences of the other teachers at schools	13	Computer teachers **are not happy**. They just save the day.
		The computer teachers' salary	12	I think the teachers **cannot live** on this salary. They earn less than I spend at university
		The difficulty of catching up with the technology	12	Technology change rapidly. We have to follow these developments. But I think that it is not easy and I am afraid of not to continuing.
		Anxiety of KPSS	19	I cannot understand the reason **for KPSS**. I always **dream** about the **exam.** It is **nonsense** for me. What about the education we got for four years?
		The opportunity to work in private sectors	4	I sometimes think that our profession is not satisfied me. opportunities to get a job other sectors are getting me attracting to think different professions.

4.3.2. Results with Inservice Teachers

The same interview and observation schedules which were prepared by the researcher and conducted with preservice teacher focus on basic education computer teachers' views and thoughts while they are doing teaching in schools. Convenience samples were selected in terms of the first phase of the study, which aforementioned in the methodology chapter. Gender, high school, university and perceptions were taken into account when selecting the participants.

Twelve teachers, who graduated from CEIT departments and worked in basic education schools in the central towns and districts of Ankara, were interviewed. Moreover, 4 teachers' classrooms were observed during their teaching. In the interviews, the computer teachers, who graduated from CEIT departments and were engaged in the applications, were asked for their opinions about the computer teaching profession and computer applications.

Interviews started with initial questions to obtain information about the interviewees. 2 of 12 interviewees were from Middle East Technical university, 3 of them were from Ankara University, 3 of them were from Gazi University, 2 of them from Anadolu University, 1 from Hacettepe University and 1 of them Balıkesir University. 6 of inservice teachers were female, and 6 were male. Their experience varied from 1 to 4 years. As for the opinions of preservice teachers, all the teachers believed that instructional technology was very important for teaching and learning activities; however, according to their responses, computer teachers were different from other teachers in terms of profession. The following themes were extracted from inservice teachers' responses based on the research questions, which were formed by using Strauss and Corbin's (1998) interview analysis strategies.

4.3.2.1. Perceptions of Teaching

Students' Attitudes towards Computer Course and Teachers

During the interviews, the opinions of the inservice computer teachers were noticed to be similar to the opinions of the prospective teachers in many respects. The computer teachers stated that the interest of the students in the computer course and teachers affected the computer teachers' perception of the teaching. In parallel with the views of the prospective teachers, most of the computer teachers (n=8) also asserted that the students came to the computer laboratories just to play games and to have fun.

About this matter, the opinions of a female teacher, who has been teaching for 3 years, were as follows:

> "..The students come to the computer laboratory for playing games and to chat with someone. Almost all of the students have an e-mail account. Some of them can use MSN, and they explain how they use this program to the students, who do not know how to use it. It takes lots of time to settle and silence them." [1]

Another teacher (male and teaching for 2 years) explained his opinions as follows:

> "The children like computers, it clearly seems that they have fun during the lesson, but they do not want to study it as a course. They just want to come to the class and have fun. This has been so for two years for me as a teacher. At the beginning I interfered with that situation, but I do not worry about it now, because class hours were limited..." [2]

Same situations also were observed during the classroom observations. For example in one of the class, teacher allowed students for playing game in the lab. Students liked from this situation and they started to play game immediately in the computer lab.

Almost all of the computer teachers (n=9) stated that since the duration of the lesson was very limited they could not show enough concern for the students. Moreover, they affirmed that the only thing the students were concerned with was LGS or OKS (high school entry exams). Therefore, they thought that the students were not interested at all in computer courses. They also claimed that if such kind of exams included questions about the information technology subject area, the students would be more interested in computer courses.

The opinions of a male teacher, who has been teaching for 4 years, were as follows:

> "The students are not aware of the importance of the computer course. No matter how much we try to make them realize it, the only thing they pay attention to is the general exams like LGS or OKS. This makes me worried. I think such kind of exams should contain questions from the information and technology subject area so that the students will be more interested in computer technology and they can realize that the computer is not just for playing games..." [3]

The teachers (n= 11) also stressed that students in the class see computers courses as a time for playing game.

One of the teachers said:

> " .. when students came the lab, there is a game in their mind. They immediately start to play a game in the computers. When I don't allow them to play, they hate me, and I am getting a bad teacher..."[4]

This situation was also observed during the classroom observations. For example, in one class observation, students wanted to play a computer game. Teacher allowed students to play at the end of the course.

Almost all the teachers claimed (11) that the levels of students' computer knowledge affected their teaching in the computer lab.

The views of a 3 years female teacher were as in the following:

> "... in my class, some of students know much more things about computer and its applications such as office programs. I can also say that some of them have internet web address. Can you imagine they use blogs or such kind of things? On the other hand, some of them don't

> know anything about computers. Some of my students saw computers the first time in the class. So, do you understand me and difficulties of my job? " [5]

The teachers (n=5) suggested that attention was paid by the students to the computer assisted education more than the computer courses. They thought that this would provide the students with a better environment to study other courses in relation to the computer assisted education.

As an example, one of the teachers (male and teaching for 4 years) explained his ideas as:

> "I don't find much sense in the computer courses. We should utilize the computer-assisted education more. In this way, the students will be already learning how to use the computer along with the subject of the course and they will have the opportunity to apply what they have learnt." [6]

Another teacher (female and teaching for 1 year) thought about this topic as follows:

> "The students should be provided with the computer assisted education opportunities. I think it is not enough just to teach the students about the computers in the computer laboratories. In order to supply richer and enjoyable learning environments, the computers should be utilized in every course." [7]

Similarly, all of the teachers (n=12) pointed out that the curricula followed at schools were futile. They insistently emphasized that they usually did not follow the curricula because they thought that the curricula are very old-fashioned, there are unnecessary repetitions in them, and it impedes the efficient utilization of the computers by the students and by the teachers.

A computer teacher (teaching for 2 years) explained her ideas as follows:

> "According to the curriculum of the school, I am supposed to introduce the keyboard to the students for two weeks, but they are already familiar with the keyboard...This sounds very funny to me...To say it frankly, I never follow the curriculum... " [8]

Another teacher who had a 2-year experience and was female said:

> "Last year I introduced the printing machine to the third year students for 2 weeks. According to the curriculum, I am supposed to re-introduce the printing machine to the same students...It is true that the technology is continually developing, but the technological development is not limited to the progress in the printing machines..." [9]

Similar troubles were observed during the classroom observations. To illustrate, one teacher tried to teach different issues such as preparing basic web page rather than to introduce a printer in the classroom activities.

Most of the teachers (n=10) asserted that the students should be provided with more opportunities to use the computers. They emphasized that if it is possible the computers should be utilized in all of the courses. Moreover, the computer laboratories should be open to utilization also out of the school hours. According to them, as long as the computer laboratories are not made use of efficiently, it is not so much of importance to equip the computer laboratories with new technology. They emphasized the importance of providing the students with technology all the time.

The views of the teachers about this matter were as follows: (Female and teaching for 3 years)

> "The using of the computers should not be limited to the computer courses. The students can be provided with more opportunities to use the computers. For example, the students can be supplied with an environment in which they can use the technology out of the school hours... It is not enough just to found computer laboratories. To utilize them efficiently and effectively is more important..." [10]

Another teacher (female and teaching for 2 years) thought as:

> "When I was first assigned to this school, the computer lab was founded recently, but it was not utilized efficiently. The headmaster of the school was very proud of having up to date computers, but he did not accept when I suggested that we use the computers in every course and even out of the class hours. It is not important to have a lot of new computers if we do not utilize them." [11]

The opinions of another teacher were as follows:

> "Most of the students follow the progress in technology. Therefore, they are familiar with the computers. Moreover, they are very keen on attaining education in a technological environment. Thus, the technology classes should be utilized more effectively...The students should be able to use the computers out of the computer courses and even in out of the school hours. It will be absolutely better for them than going to the internet cafés..." [12]

Another teacher explained his ideas as follows:

> "...Most of the students do not have computers at home; therefore, they should be able to use the computers in the school as much as possible...They should be able to use them when they do not have lessons and whenever they want...However, this is not possible for now because there is just one computer laboratory and one computer teacher that is me..." [13]

The General Perception about Teaching as a Profession

Many teachers (n=6) stated that they liked the teaching profession and practiced it willingly. They frequently asserted that sharing their knowledge with other people is a very nice feeling.

As an example, a female teacher, who had been teaching for 4 years, explained her opinions like as

> "I like teaching profession very much because I like children and I like sharing...This is a profession that should be accomplished willingly. Unfortunately, we can witness the negative results of doing the teaching profession unwillingly..." [14]

Almost all of the teachers (9) stated that the conditions of teaching were not good and they especially complained about the inadequateness of the salary.

One of the teachers said:

> " .. for me, willingness is the most important aspects in teaching, however as compared with other countries, conditions of teaching in

> Turkey is very bad. For example salary, with an average of teaching salary is difficult to get along…"[15]

Some of the teachers (n=4) said that they chose this profession because they had to, but they gradually became more and more accustomed to it and found it more enjoyable as they get experienced.

A female teacher, who has been teaching for 4 years, thought:

> "I chose only teacher training departments when I took the university entry exam due to my program in the high school and also I thought that it would be a guaranteed work. The first year I started teaching I had lots of difficulties and troubles. I even thought of resigning. However, as time passed by, I got used to my profession and I liked teaching and the children. Now I am glad not to have resigned..." [16]

General Perception about Computer Teaching as a Profession

Although almost all of the views of the computer teachers and prospective teachers about this issue are the same, there are some slight differences. These differences can be summed up as follows.

The teachers (n=6) claimed that the computer teaching profession has many distinct features compared to the other professions. They pronounced that it has some advantages as well as some disadvantages especially when compared with the other branches of teaching.

For instance, a computer teacher (female and teaching for 3 years) explained her ideas as in the following:

> "…according to my experience, when compared to the other professions, the computer teaching profession has some disadvantages. There is a machine between the teacher and the students, and this machine attracts the students' attention more than the teacher does. Although the teacher tries to teach them new things, they insistently either do not listen to him or they pretend to be listening." [17]

Most of the teachers (n=9) stated that computer teaching is not necessary in these days. According to their views teaching computer as a tool is nonsense, because students are already familiar with computers as machine.

One of the teachers thought as follows:

> "...For me computer teaching might be a good profession before. It was considered as the profession of the future, but it is not now today's profession. Moreover, we are not paid enough attention in the professional environment." [18].

Another teacher stressed:

> "...I was very exciting before starting teaching; however, I understood that computer teaching is getting strange for me. Because, for me it is meaningless to teach computer as a machine..." [19]

Eight teachers thought that the roles of the computer teachers in the schools should be changed or re-described keeping in mind the fact that the computer teachers mostly complained about their being regarded as technical service staff and being charged with the responsibility of the technical work in the schools.

One of the computer teachers explained:

> "The label of the computer teachers should change and their roles should be re-described. If they want us to work more efficiently, they should not make use of us as technical service engineers or this responsibility of the computer teachers should appear in the job description. I accept to be responsible for the computers in the computer laboratory and I can repair them if necessary. However, I cannot cope with all the computers on my own. There should be assistants to help me. Sometimes I ask the students to help me, but I don't know how right it is..." [20]

Another computer teacher (female and teaching for 4 years) had the following very interesting opinions about this matter:

> "...Moreover, we are considered as technical service in the schools. We are also expected to accomplish the responsibilities of the administrators...A few days ago, the headmaster of the school asked me

> to write the investigation reports of a teacher and a caretaker in the school. It does not appear in my job description...I am trying to do my best, but I feel exhausted...I try to make use of the technology efficiently, but it should not have such results..." [21]

Some teachers (n=5) declared that they were losing interest in the computer teaching profession as time passed by.

To illustrate, one computer teacher thought:

> "I have been teaching for 2 years. I studied at the CEIT Department at university after I got high scores in the university entry exam. I attained education in such subjects as Programming Languages, Flash, Simulation Software, Database, Distant Education, Computer Assisted Education, Educational and Information Technology, and Material Development. I started teaching very ambitiously as a member of a group that could adapt to the computer age the most easily after having attained education in all these areas. I cannot explain how I lost the inclination to teach as time went by." [22]

Many computer teachers (n=7) complained about formator teachers and their roles in the schools. According to their explanations, they do not agree with them in many respects.

For example a male teacher, who had been teaching for four years, explained his ideas as follows:

> "There is a formator teacher in my school...We cannot get on well. The only thing he does is to follow the curriculum. I accept that the formator teachers did many useful things in the past, but I think they fulfilled their function. The formator teacher in my school has not been able to keep up to date. Therefore, they should give such kind of work to us because we were educated in this area for many years..." [23]

Computer teachers (n=6) stated that the great expectations from them also influence their effectiveness in the school. According to their expression, the principals, students as well as other people from outside of the school think that computer teachers introduce to them all innovations.

To exemplify, a 3-year female computer teacher stated:

> " ..Sometimes I am afraid of my job. I think due to its name, my profession, as a computer, everybody supposes that we must know everything. However, you know it is impossible to do that. For example, recently my neighbor has asked me about internet problem, and I have not solved this problem" [24]

Computer teachers (n=8) highlighted that computer teaching must be associated with other subject areas. That is to say, if they study with other teachers, technology integration will be more effective in schools.

One of the computer teachers detailed her ideas as in the following:

> "...to me, as a computer teachers we have to contact with other branch of teachers in school. I sometimes give a training other teachers especially about software programs. This is important I think, because we are not responsible using technology in schools. Other teacher also must use it as soon as possible". [25]

4.3.2.2. Competencies

Pedagogical Competencies

The teachers explained that the pedagogical knowledge they attained during their university education did not correspond to the real life teaching context. 6 teachers stated that they developed their own teaching strategies according to the real life context. They all agreed that the courses of pedagogy in the universities should be changed and the computer teachers should not be distinct from the teachers in other subject areas.

One of the teachers (male and teaching for 4 years) thought of this issue as:

> "...The knowledge taught in the universities and the applications in the schools are very different from each other. The theory and the practice do not suit each other..." [26]

Another teacher stated:

> "I never benefited the computer teaching subject area and pedagogical courses. From the day when I started teaching, I developed my own teaching strategies in accordance with my experiences in the lessons and the experiences of the other teachers and with the students' learning levels".[27]

Some of the teachers (n=4) stated that they determined their own teaching strategies in accordance with the education they attained in the university.

For instance, one of the teachers (female and teaching for 2 years) thought:

> "At university, we focused on the student-centered education so much that now I try to follow the principles of the student-centered education in my lessons. Since the theory and the applications did not suit each other very much, I had some difficulties at the beginning; however, afterwards I started developing my own teaching strategies." [28]

Teachers (n=6) stated that preparing a lesson plan for the computer class is not necessary. According to their opinions, the subjects handled in class, and the computer and its applications are in constant change. Therefore, the stable lesson plans for computer lab is unnecessary as well as meaningless.

As an example, the opinions of a teacher about lesson plans were as follows:

> "...another strange thing for me to prepare lesson plan in the computer lab. Can you imagine that, we are supposed to prepare lesson plan for a machine, a computer, everybody knows that computer hardware and software like programs are changing in every year. For example, I don't understand to prepare about using MS. Windows 95 in the class, you know this is old one. ..." [29]

Almost all the teachers (n=10) highlighted that the computers changed the atmosphere of the classroom. According to their opinions, although they were familiar with the computer environment, they sometimes had troubles in the computer lab

The opinions of a teacher (female and teaching for 3 years) concerning this issue was as follows:

"I always interact with my students. The computers keep the interaction between the teacher and the students alive. For instance, if I explain to the students how to get an e-mail account and how to send e-mails, I ask them to send e-mails to me or to their friends. I explain the subjects to the students until I make sure that all the students understand them. This requires a patient and respectful communication." [30]

Another teacher explained his opinions as in the following:

"I know this environment since I graduated from vocational high school. I know students' interest and their needs. However, teaching is more different than being a student. Some time I am confused about students' behaviors, then experience is getting importance." [31]

The fact that the computer courses have implementations encourages the teachers mostly to arrange projects. According to their views, implementing real-life projects in the lab make the lesson more enjoyable for the students.

For instance, a teacher (male and teaching for 4 years) reported:

"I have been applying the project-based teaching model. When I teach Word, Excel and Google to the 6th year students, I relate these subjects to the project of developing a magazine. The students do not realize that they are doing it for the sake of learning. They think that their aim is to develop a magazine. We developed two magazines that were of very good quality in the last two years. The children enjoy the lessons very much and they learn very quickly and efficiently." [32]

Almost all the teachers (11) asserted that the teaching practice in the university is inadequate. They suggested that it should be made more comprehensive. Moreover, according to their opinions, extra pedagogical classes were needed in the CEIT departments.

The opinions of a teacher about this issue were as follows:

"We did not pay enough attention to what we heard from our university instructors and from the mentor teachers at the schools we attended for the teaching practice...However, we realize what they meant when we experience the same things and we say to ourselves that they must have meant that...I now think that it would be better if the teaching practices were extended into four years of the university education and the prospective teachers got experience in these years." [33]

Another teacher said:

> "..I took many pedagogical classes during my university years. At that time, I was thinking these classes were waste of time, however, now I am thinking as opposite of this idea.... I wish I had taken more pedagogical classes. Honestly, I definitely understood that there should be extra classes such as educational psychology and educational philosophy."[34]

Teachers (n=7) also stated that communication with the students is very difficult in the lab. Moreover, everything is quite different from university years. They pointed out when there is another object between the teacher and the students, namely the computers, the situation differs. Namely, it is not the same as it has been told at universities.

One of the teachers thought:

> "I was quite excited when I first started teaching. The students were playing games downloaded on the computers recently. They were asking questions about the game. It was my first week at school and I was not familiar with the system and the game...I thought I should know all the things and I should manage the class efficiently. I was not sure about what I should do, what I show the students or what I should present them...At the same time I was thinking of what I learnt at university. It was assumed that what the teacher would present in the class was planned before he came to the class and the students were ready for the lesson and for what the teacher would present them...But I realized that it was not the same in practice as in the theory. " [35]

Another teacher's opinion was:

> ".....All of the students were talking. The students asked for permission to explain the game to their friends. They were giving clues to each other, but I could do nothing. I could not decide what to do...I was looking forward to the break time. When it was the break time, I started to investigate what the students were doing during the lesson, but I was in a panic..." [36]

Some of the teachers (n=6) addressed that the limited time of the lesson affected the pedagogical requirements in the class. They stressed that the computer lab was done one hour a week, which was not enough to fulfill all the pedagogical as well as other requirements of the course.

One of the teachers (male, 1-year experience) explained his ideas as:

> "... as you know there is a just only one hour in this lab for a one section. Can you imagine that this is adequate? Definitely not. I could not explain to my principal that it is not enough time to do something in the class. So I am not being able to interest all students in the class hour". [37]

Time limitation was also clearly seen in the class observations. The teacher was not able to finish all the activities planned before the class. He gave homeworks to students so that they could complete some activities during their leisure times.

The teachers (n= 7) were also concerned about the new curriculum, especially its evaluation part. They claimed that they had no idea about the new curriculum and its applications, and they especially did not understand how they would evaluate their students in the new curriculum.

A 3-year female teacher's opinion was:

> " I did not understand anything about new curriculum. We heard it was changed, and one of my friends participated in training about new curriculum. He tried to explain about it. But this is big chaos for me and my friends in schools. It is not understandable, old curriculum changed, but there are lots of troubles in this claimed new curriculum" [38]

Another teacher's was:

> "I was shocked when I looked at the new curriculum. Especially, we were as a computer teacher in trouble about students' evaluation. You know, in lab it is very difficult to evaluate them. We think that new curriculum would provide solution about this problem. But I noticed that it is more problematic own self... I did not understand how we evaluate student according to new evaluation criteria" [39]

The teachers (n=5) highlighted that the experienced teachers should share their experiences with the prospective teachers during university years. According to their opinion, this would be very useful because they believed that experience was one of the most important aspects of teaching.

One of the teachers thought about this matter as:

> "I do not have very big problems; however, considering the difficulties I am now experiencing, I think that it would be better if we had listened to the experiences of the experienced teachers about the applications during the university years. We did not pay enough attention what our university instructors said...Now I realize how important they were..." [40]

Competence in the Subject Area

All of the teachers shared the opinions of the prospective teachers that the education they got in the university was insufficient or had shortcomings when applied to the real-life context, and that they should keep up to date and follow the advances in the constantly progressing technology.

One of the teachers (teaching for 4 years) thought about this matter as in the following:

> "The curriculum of the school is at very basic level. It is not a matter to teach or apply it. For example, we are supposed to teach the mouse, keyboard, Word or Excel...However, I think we should pursue the progress in the technology and we should keep up to date as much as possible because we are computer teachers. I do not think that we will be good models if we do not keep up to date and if we do not inform the students and the society about the progress in technology as computer teachers." [41]

All teachers strongly agreed that the curriculum of the computer teaching should be renewed every year due to the rapid development of technology. It was also seen in the class observations that teachers did not follow the current curriculum. In one class, for instance, the teacher taught the students something totally different from the existing curriculum.

One of the teachers (female and 4-year teaching experience) stated:

> "I feel myself a fully competent to teach something about technology to students especially by following this old curriculum. However, this is not matter also it must not be matter. You know technology rapidly change in every time. Therefore, if we want to keep up with developing countries, we have to modify the curriculum in every year." [42]

Moreover, the teachers (n=8) argued that they should not only teach the computers and some computer programs, but also help the other teachers utilize technology all the time and in all courses. For instance, during the interviews, they emphasized that they should work with other teachers cooperatively and encourage them to adapt technology to their subject area.

One of the computer teachers (teaching for three years) thoght as follows:

> "Our greatest responsibility is to adapt the computer technology to all of the courses in the school…The other teachers are also responsible for that. We should cooperate with them and help them integrate technology into their subject area..." [43]

The teachers also stated that cooperating with the other teachers for material development would provide those teachers with the opportunity to carry out their lessons in a more enjoyable way and would help the students learn their subjects easily.

One of the computer teachers (teaching for 2 years) reported:

> "…We should help the other teachers develop materials…For instance; a few days ago I helped the teacher of math develop materials for his lesson. We examined a program he downloaded from the internet; he was very glad for my help…After a while, he said that the students liked it very much and followed the lesson with pleasure…" [44]

Moreover, unlike the prospective teachers, some of the teachers (n=5) emphasized that it would be more useful if they worked in the same way as student advisors did. They thought that they should be provided with an environment in which they could help the other teachers and the students integrate technology into the other subject areas efficiently. In this way, they would be continually in cooperation with the other teachers and the students, and thus the technology would be better utilized in the schools.

The opinions of a female teacher, who has been teaching for 4 years, can be summed up as follows:

> "I think we should work in the same way as the student advisors in the schools. We should develop materials for the teachers from the other subject areas and we should work in cooperation with them. Thus, we would be encouraging them to use the technology...Moreover, we would be helping the students about their problems with the computers or the other technological devices...Otherwise, I don't think we will be useful to the students by teaching them Word or Excell...If the students are provided with the opportunity to utilize technology in their other courses, they will have learnt and developed these computer skills simultaneously..." [45]

Besides these, the computer teachers emphasized a very important point. They stressed that they should teach the students how to access accurate information and to use that information. They suggested that they should arise in the students a consciousness about the computer ethics.

One of the teachers (female and teaching for 2 years) thought about this matter as follows:

> "I think today the most important matter is to know how to reach the accurate information in the internet and how to use it. When the teachers give the students homework, they search it in Google and copy all the information they find on this site. They are not concerned about whether that information is wrong or accurate...Moreover, it is not good for them to copy all the information...Well, we should teach them how to reach the correct information..." [46]

The teachers also suggested that they should be informed about the computer ethics in the university.

> "The only thing the university instructors did to encourage us to be ethical was just to decrease our grade when we copied and pasted all the information we found in the internet...However, I think it would be better if they informed the prospective teachers about the computer ethics..." [47].

Similar issues were observed during the classroom observations. For example, in one classroom teacher tried to teach the student about how they access correct information from the internet.

Moreover, half of the teachers (n=6) said that they should attend inservice training programs to be able to keep up to date. Moreover, they should be in contact with the universities, the school administrators, and the MoNE to accomplish their roles effectively.

A male teacher, who had been teaching for 3 years, explained his ideas as follows:

> "The computer teachers are not provided with inservice training programs. However, we are the first people, who should adapt to the technology. I am trying to do my best, but sometimes I cannot cope with it...The school administration and the Ministry of Education should help us about this matter and we should always be in cooperation with the universities..."[48]

The teachers (n=10) stated that there were many companies that developed educational software that should be used in schools. Almost all the teachers also agreed that they should examine this software and help the other teachers use them.

In the following is presented one teacher's opinion concerning this matter:

> "There emerge lots of software companies in parallel with the development of technology. All of them develop educational softwares, and some of them are really of good quality...We should have the opportunity to use them in our courses, but since the teachers from the other subject areas do not know how to use them efficiently, we are

responsible to help them. We should assess these softwares and work cooperatively with the other teachers to provide the students with the opportunity to make use of them." [49]

The computer teachers asserted that the teachers should work a lot to accomplish the activities in the new curricula and such kind of educational softwares would be of great use for them in this respect.

One of the teachers (female and teaching for 3 years) explained her ideas about this as follows:

> "A few days ago one of the teachers brought me a CD and said that it included a very useful program but he could not play it...Afterwards, we examined the CD together and we noted down the information he would use and he presented it to his students...Then he said that the students were very interested in it and he thought he should always use such kind of programs..." [50]

Moreover, the teachers (n=4) stated that there should be a common portal on the internet that all of the teachers could follow.

Similar issues were observed during the classroom observations. Teachers tried to use various materials and tools in the computer labs during their activities.

As an example, one of the teachers thought:

> "There are plenty of formal and informal web sites, forums, professional groups and magazines on the internet that I follow. Some of them are trusty, but I am not sure about the others...However, I think if there were a common portal for the computer teachers and we shared our knowledge in that portal, it would be very nice. For instance, I think that we can use the ilsis (Provincial National Education Directorates Management Information System) of the Ministry of National Education for this aim." [51]

4.3.2.3. The Factors That Encourage/Discourage Computer Teachers to Work at Schools

The views of the teachers about this matter were similar to the views of the prospective teachers. The teachers thought that the main factors influencing their performance were the applications at the schools, the outdated of the curricula; the scarcity and unusefulness of the computers; their being made use of as technical service staff; the time limitation of the computer courses; the optional status of the computer course; and the attitudes of the school administrators, the students and their parents towards the computer courses and the computer teachers.

One of the teachers explained his ideas about this matter as:

> "...The fact that the school administrators consider the computer course as drudgery, it lessens my inclination to teach computers. They think that the computer course is not very important...I think the problem is with the label of this class, computer teaching...The students see the computers only in the computer classes. ...they do not use the computer laboratory for the other courses...I think it should be made use of in the other courses as well..." [52]

Another teacher had the following interesting views about the use of computer teachers as technical service staff:

> "When I first started teaching, the information technology class was very old. I renewed all of the technological equipments. I changed the organization of the classroom. I sorted out the problems with the network connections. While the other teachers were chatting with each other and having their tea, I worked in the computer laboratory. I cleaned even the inner parts of the computers. I changed the organization of the seats in the laboratory without getting any help. Although I was supposed to work for 15 hours, I worked in the laboratory from 7 A.M to 5 P.M. I sorted out the problems of all the computers. I worked like a workman."[53]

Another teacher stressed:

> "...The capacity of the computer laboratories at schools should be limited to 20 students. In accordance with the education I attained in the

university, I used to think that it was good to replace as many computers as I could in a particular space, but I found out that it was not so in practice. I had classrooms with 15 students or 30 students. Without having the opportunity and time to deal with the work of every individual student, it is hardly possible to say that I have had an efficient lesson." [54]

The teachers (n=7) also stated that there were formators teachers in the schools who were not much qualified at computers and technology. According to them, those formator teachers had very important functions for the use of technology in the schools; however, they could not adapt to the constantly developing technology. Moreover, they thought that these formators did not have pedagogical knowledge, though some were really very good at the technical matters. They thought that they could ask for help from these formator teachers about technical matters.

A male teacher, who had been teaching for 2 years, thought of this matter as follows:

> "...I did not feel offended with the work I did at the school even though I did not get any extra payment; however, what disturbed me was the fact that the computer formator teachers, who had been trained for just 180 hours, were respected more than I was. A class teacher works as a computer formator at my school and spends his time sitting in the staff room and despite this, he gets extra payment. Although I deal with all the work at the school and teach computer courses, I do not get any extra payment..." [55]

A teacher, who served at a private school, reported:

> "I work with another colleague cooperatively at my school. He is a formator teacher and he deals with the technical works. He repairs the broken computers and he is also engaged in the web site of the school. I teach the computer course. We agreed to share work in that way and we are very happy with that situation. The school administration supports us about that situation..." [56]

The computer teachers (n=5) think that the organization of the computers in the computer laboratories is as important as the number of the computers for the efficiency of the lessons.

To exemplify, one teacher stated:

> "... Therefore, I always support that the organization of the computer laboratories is highly important...But they do not ask for the computer teachers' opinions when they arrange the computer laboratories..." [57]

Almost all of the teachers complained about the time limitation of the computer course. Concerning this issue, one of the teachers thought:

> "...To switch the computers on takes 5 or 10 minutes. To settle and silence the students takes another 10 minutes...Moreover, this course is an optional one; therefore, the students do not worry about the grade for this course...Thus, we do not have authority in the lessons. The duration of the computer courses should be revised." [58]

Almost all of the teachers (n=9) complained about the optional status of the computer classes in the curriculum. Due to this fact, many times students do not take their classes serious, which cause dissatisfaction on the part of the teachers.

For example, one female teacher who had been 3 years of teaching experience said:

> ".. my class is an optional class.. therefore students don't pay attention every time toward my classes. Sometimes I am discourage to teach. As students know that they won't take a mark, they don't listen to me. if my class is not optional, I don't confront this situation..." [59]

4.3.2.4. Satisfaction

1) Environmental Satisfaction

From the teachers' views, the following environmental factors were seen to affect their satisfaction:

- The organization of the computer laboratory
- The number of computers
- The students' interest in the course
- The drawbacks of the computer labs
- The outdated curricula

As mentioned before, the organization of the computer lab is observed to affect the performance of computer teachers. Computer labs were designed in a haphazard. It is not easy to be an effective teacher in these disorganized classes.

One of the teachers, a female having a 3-year of experience, stated:

> ".. when I started my teaching experience I was very excited. However, as I saw the computer lab, I am disappointed. It was so confused me, even if I tried to fix them. For me, computer teachers are asked when labs were designed at first." [60].

Most of the teachers (n=8) were also dissatisfied about the number of computer labs and computers.

A female teacher, who had been teaching for 2 years, thought of this matter as follows:

> ".. in my lab there are 20 computers, some of them are not working properly, some of them are very old. Some new programs are not running in these computers. There is no other lab in my school. Therefore, students are not be able to use efficiently in this lab. However, for me students can utilize from these computers whenever and wherever they want, since many of don't posses own computers in their home" [61]

Some of the teachers (n=6) think that the both students and their parents do not pay attention to the computer teachers and they do not speak to them when they come to the parents and teachers meeting.

One teacher thought:

> "In the parents and teachers meeting, the parents talk to all of the teachers except me...But I insistently talk to them about the students' efforts in the computer course...However, I see that they do not listen to me, and that hurts me a lot..." [62]

8 teachers stated that the outdated curricula and their being considered as a technical service staff by others were other factors making them dissatisfied.

One of them explained his ideas as:

"...There is something wrong with the educational system because they could not specify the concepts about this profession. I am getting tired of to teach old and meaningless curriculum in every year.......the computer teachers are considered as technical service engineers, and sometimes they carry the things to an exaggerated degree, and they ask us to fix the photocopier." [63]

2) Professional Satisfaction

Teachers stated that following the factors also affect their professional satisfaction while serving as computer teachers:

- The computer teachers' role
- The computer teachers' salary
- The difficulty of catching up with the technology
- The opportunity to work in private sectors

What mentioned above can be claimed to be the indication of the computer teachers' satisfaction about their profession. One of the commending matters the teachers question is the role of the computer teachers.

About this matter, one of the teachers stated the followings:

"Our job at the schools has not been described yet. I had many difficulties in carrying out my profession. I always thought of resigning instead of trying to get used to my profession. This subject area needs lots of revision and reorganization. First of all, the need for the computer teachers should be questioned or the responsibilities of the computer teachers should be re-described." [64]

Another teacher reported:

"I think the most important problem of the computer teaching profession is job description. I had never thought of this potential problem until I started teaching. We do not have problem about this matter in my current school because we have an information-processing unit in school. However, I had many troubles while I was teaching at a state school. We are not service engineers." [65]

The teachers (n=7) stated that they especially had financial problems, and it was hardly possible for them to live just on their salary. They had many expenses since they dealt with technology. Some of the teachers confessed that they were doing extra jobs.

One of the teachers (teaching for 3 years) thought:

> "The amount of our salary is really funny. I work in a big city and everything is very expensive...We have also some expenses for our profession. I always think if I will be able to last the month. I have other job opportunities, and I may resign from the teaching profession..." [66]

Another teacher reported:

> "I want an increase in my salary because I have to do extra jobs. However, I think that my salary should be enough for me to live on so that I will have better performance in my teaching profession." [67]

Some of the teachers (n=4) asserted that when they first attended the CEIT Department at the university, they felt very regretful; however, after they started teaching, they began to like their profession.

One of the teachers thought:

> "...Since I graduated from a technical high school, I didn't have many choices in the university exam. I had to choose computer teaching profession and I attended CEIT Department. At the beginning I felt very regretful for having chosen this department, I found it very futile. However, after I started teaching, I liked it very much. I like both the children and the technology..." [68]

Some of the teachers (n=5) asserted that they started teaching with high motivation because they thought that they would be able to do extra job while they were teaching at school and they could make money in this way. However, in time they understood that was not possible.

One of the teachers explained his ideas about this matter as follows:

> "I used to think that after I graduated from CEIT Department, I would not have to teach at the schools. To be honest, I was planning to work in the private sector and to make lots of money. I had that dream in the 1st year of my university education. However, in the following years I realized that it was not possible to work in private sector with the education we attained at this department. By all means, the individuals should improve themselves in their subject area, and we cannot expect the department to teach all the things. But after I attended this department, I did not have inclination to develop myself or to make research any more. Afterwards I thought only of teaching at a state school." [69]

Some teachers (n=6) asserted that it was very essential for the individuals to develop themselves during their university education, and they also said that they realized the importance of this fact better after they became teachers.

As an example, one of the teachers explained his ideas as follows:

> "...I was at ease when I was a student. After I graduated I realized that I wasted my time thinking that my department was very easy and I did not have to study. But, afterwards I felt very upset because I had wasted so much time. Now I am trying to learn all the things I did not study at the university just due to indolence...In other words, when you are a student, you can ask questions, but if you are a teacher you have to answer the questions. If necessary, the individuals should ask questions to learn the things so that they can answer the questions the other people ask them in the future..." [70].

Table 4.20 *Summary of the interviews with inservice teachers*

Theme	Code	Sub code	N	Example quotations
Perceptions	**1.1 Students attitudes towards computer course and teachers**	Students' interest about computer courses and teachers	8	...the children **like computers**, it clearly seems that they **have fun** during the lesson, but they do not want to study it as a course.
		Students' attentions for other things such as OKS exam etc.	9	....the only thing they **pay attention to is the general exams** like LGS or OKS. This makes **me worried**. I think such kind of exams should contain questions from the **information and technology**
		Students consider the computer course as a time for playing games	11	.. The students come to the computer laboratory for **playing games** and to chat with someone.. When I don't allow them to play, they **hate me**, and I am getting a **bad teacher**
		Students' learning levels and level of computer knowledge	11	some of students **know** much more things **about computer and its applications** such as office programs, Can you imagine they use blogs or such kind of things? On the other hand, some **of them don't know anything** about computers
		students are bored with repeated curricula	12	I am supposed to introduce the **keyboard** to the students **for two weeks,** but they are **already familiar** with the keyboard...This sounds very **funny** to me... To say it frankly, I **never** follow the **curriculum.**
		Utilization from computer lab frequently and properly	10	In point of my knowledge, the students can be provided with **more opportunities** to use the computers. The students should be able to **use** the computers in out of the computer courses and even **out of the school hours.**

Table 4.20 (cont'd)

Theme	Code	Sub code	N	Example quotations
		The computer courses provide students with a different environment	5	In order to supply **richer and enjoyable learning environments**, the computers should be utilized in every class
	1.2 General perception about teaching as a profession	Compulsoriness being teacher	4	I **had to choose** only teacher training departments when I took the university entry exam due to my program in the high school. The first year I started teaching I had **lots of difficulties and troubles**…
		The conditions of the teachers	9	as compared with other countries, **conditions** of teaching in Turkey is very bad. For example salary, with an **average** of teaching salary is **difficult to get along.**
		sharing knowledge	6	I **like** teaching **profession** very much because I like children and I like **sharing...**
	1.3 General perception about computer teaching as a profession	Indifferences with other subject areas teachers	6	..according to my experience, when compared to the other professions, the computer teaching **profession has some disadvantages.**"**...There is a machine** between the teacher and the students, and this machine attracts the students' attention more than the teacher does.
		losing interest in the computer teaching profession	5	I started teaching very ambitiously……. I cannot explain how I lost the inclination to teach as time went by
		More expectations from computer teachers	6	sometimes I am afraid of my job. I think due to its name, my profession, as a computer, everybody supposes that we **must know everything.**
		computer teachers role	7	…I accept to be responsible for the computers in the computer laboratory and I **can repair** them if necessary. However**, I cannot cope with all the computers** on my own

Table 4.20 (cont'd)

Theme	Code	Sub_code	N	Example quotations
		The computer teaching profession is nonsense	9	"..For me computer teaching might be a good profession before. It was considered as the profession of the future, **but it is not now today's profession**
		Formator teachers influence their duties	7	We **cannot get on well**. The only thing he does is to follow the curriculum. I accept that the formator teachers did many useful things in the past, but I think **they fulfilled** their function
		Computer teaching is an interdisciplinary subject area	8	I sometimes give a training other teachers especially about software programs. This is important I think, because we **are not responsible** using technology in schools. Other **teacher also must use** it.
2.Competencies	2.1 Pedagogic competencies	Lesson plans unnecessary for the computer lessons	6	"..another **strange** thing for me to **prepare lesson** plan in the computer lab.
		Using teaching methods in class	9	From the day when I started teaching, I **developed** my **own teaching strategies** in accordance with my experiences in the lessons.
		Real-life projects	4	When I teach Word, Excel and Google to the 6th year students, I **relate** these subjects to **the project** of developing a magazine. .
		Communications of the teacher with the students.	7	… …But I realized that it was not the same in practice as in the theory…
		Time limitation affect the pedagogical requirements in the class	6	as you know there is **a just only one hour** in this lab for a one section… So I am **not being able** to interest all students in the class hour..
		Confusions about the new curricula especially its evaluation criteria in basic schools.	7	…but this is **big chaos for** me and my friends in schools. **It is not understandable**, old **curriculum changed**, but there are lots of **deficiencies** in this claimed new curriculum. …especially, we were as a computer teacher in trouble about **students' evaluation**.

Table 4.20 (cont'd)

Theme	Code	Sub_code	N	Example quotations
		Classroom management/different environment	10	I explain the subjects to the students until I make sure that all the **students understand them**. This **requires** a patient and respectful **communication**
		Experience in teaching is important	5	"I do not have very big problems; however, considering the difficulties I am now experiencing, I think that it would be better if **we had listened to the experiences** of the experienced teachers about the applications during the university years.
		More pedagogical courses are needed during the training.	11	..I now think that it would be better if the teaching practices **were extended into four years** of the university education ..Honestly, I definitely understood that there should be extra classes such as **educational psychology and educational philosophy.**
	2.2. Subject matter competencies	Keeping up the development of technology	12	"The **curriculum** of the school is at very **basic level.** It is not a matter to teach or apply it. For example, we are supposed to teach the mouse, keyboard, Word or Excel…However, I think we **should pursue the progress in the technology**...
		Need for Inservice training	6	…. we are the **first people**, who should **adapt to the technology**. I am trying to do my best, but sometimes **I cannot cope** with it…The school administration and the Ministry of Education **should help us about this matter** and we should always be in cooperation with the universities
		The curricula of the computer course.	12	I feel myself a **fully competent** to teach something about technology to students especially by following this **old curriculum**. However, this **is not matter** also it must not be matter… .. if we want to keep up with developing countries, we have to **modify** the **curriculum for every year**

Table 4.20 (Cont'd)

Theme	Code	Sub_code	N	Example quotations
		Working cooperatively with the teachers at school and preparing teaching materials with them.	8	...The **other teachers** are also responsible for that. We **should cooperate with them** and help them integrate technology into their subject area. ...a few days ago **I helped** the teacher of math **develop materials** for his lesson
		arising the students' consciousness about the computer ethics	4	.. ...students are not concerned about whether that **information is wrong or accurate...**Moreover, it is not good for them to copy all the information...Well, we should teach them how to reach the correct information. ...I think it would be better if we informed during the university years **about the computer ethics**
		Preparing, developing, evaluating and using educational software.	10	...We **should have the opportunity to use** them in our courses, but since **the teachers** from the other subject areas **do not know how to use** them efficiently,. **We should assess** these software and **work cooperatively with the other teachers** to provide the students with the opportunity to make use of them
		Servicing as a student advisor in schools	5	I think we **should work** in the same way **as the student advisors** in the schools. ... we would be **helping** the **students** about their problems with the computers or the other technological devices...
		Having a educational portal	4	...however, I think if **there were a common portal** for the computer teachers and we **shared our knowledge** in that portal, it would be very nice. For instance, I think that **we can use the ilsis** (Provincial National Education Directorates Management Information System) of the Ministry of National Education for this aim

Table 4.20 (cont'd)

Theme	Code	Sub_code	N	Example quatations
3.The factors that encourage/discourage computer teachers to work at schools	Plenty of factors that influence the teachers' decisions about working at schools.	Number of the computer labs and scarcity of the computers.	7	The **capacity of the computer labs** at schools should be limited to **20 students.** I had **classrooms with 15 students or 30 students.** Without having the opportunity and time to deal with the work of **every individual student,** it is **hardly possible** to say that I have **had an efficient lesson**
		Considering as a technical service in schools.	8	When I first started teaching, the information technology class was very old. I **renewed** all of the technological equipments. ..Although I **was supposed to work for 15 hours,** I worked in the laboratory from **7 A.M to 5 P.M.** I sorted out the problems of all the computers. **I worked like a workman.**
		Organization of the computer labs	5	I always support that the **organization** of the **computer laboratories** is highly **important**...But they **do not ask for** the **computer teachers' opinions when** they arrange the computer laboratories
		The duration of computer courses and being optional of the computer courses	9	my class is an **optional class..** therefore students **don't pay attention** every time toward my classes. Sometimes **I am discouraged** to teach. As students know that they won't take a mark, they don't listen to me. if my class is not optional, I don't confront
		The attitudes of the school administrators towards technology	9	The fact that the school **administrators consider** the computer course **as drudgery,** it **lessens** my inclination to teach computers. They think that the **computer course is not very important**...I think the problem is with the label of this class.
		The attitudes of the parents towards the computer course and teachers	11	Some of the **parents do not give importance to the computer** courses and teachers. Moreover, some of them **do not like** computer teachers because the computer teachers let their children play computer games

Table 4.20 (cont'd)

Theme	Code	Sub_code	N	Example quotations
4. Satisfaction	**4.1 Environmental satisfaction**	The organization of the computer laboratory	5	when I started my teaching experience I was very excited. However, as I **saw the computer lab**, I am disappointed. It was so confused me, even if I **tried to fix them**. For me, computer teachers are asked when labs **were designed at first**.
		The number of computers	8	in my lab there are **20 computers**, some of them are not working properly, some of them are very old. Some new programs are not running in these computers. There **is no other lab** in my school. Therefore **students are not be able to use** efficiently in this lab. However, for me students can utilize from these computers whenever and wherever they want, since many **of don't posses own computers** in their home
		The students' interest in the course	6	In the parents and teachers meeting, **the parents talk** to all of the teachers **except me**...But I insistently **talk to them** about the students' efforts in the computer course...However, **I see that they do not listen to me,** and that hurts me
		The drawbacks of the computer labs	6	Some computers are impaired and some are not usable in my school. .. computers are outdated in my lab this situation is discourage to me
		The outdated curricula	9	.. I am getting tired of to **teach old and meaningless curriculum in every year**.......the computer teachers **are considered as technical service engineers**, and sometimes they carry the things to an exaggerated degree, and they ask us to fix the photocopier
	4.2. Professional satisfaction	The indifferences of the other teachers at schools	6	I always **thought of resigning** instead of trying to get used to my profession.

Table 4.20 (cont'd)

Theme	**Code**	**Sub_code**	**N**	**Example quotations**
		The computer teachers' salary	7	The amount of our **salary** is really **funny**. I work in a big city and everything is very **expensive**...We have also some **expenses** for our profession
		The difficulty of catching up with the technology	6	Now I am trying **to learn all the things** I did not study at the university just due to indolence...
		The role of the computer teacher	6	.. I had many difficulties in carrying out my profession. ... First of all, the need for the computer teachers should be questioned or the responsibilities of the computer teachers should be re-described.
		The opportunity to work in private sectors	4	...honestly, I am planning to work in the private sector and to make lots of money.

4.4. Summary of the Chapter

This chapter reveals the findings of the study. First, the quantitative findings, that is, the first phase, of the study are presented. Data collected from 1568 preservice and 104 inservice computer teachers through such questionnaires as teachers' perceptions of teaching (TPoT), pedagogical competencies, subject matter competencies and factors affecting technology integration in schools questionnaires were analyzed and displayed. Generally, the results show that both preservice and inservice computer teachers have positive perceptions towards teaching. However, there are statistically significant differences in the preservice teachers' perceptions of teaching across years. Interestingly, sophomores' perception of teaching is observed to be lower than juniors, although senior students' perceptions have the highest mean score. According to the information obtained from the participants, there is a no significant difference between male and female preservice teachers' perception of teaching.

Regarding competencies, results show that pedagogic and subject matter competencies get higher across their teacher education programs. Moreover, results indicate that in pedagogical competency female students' teachers are more competent than male students are; however, regarding subject matter competency, male mean scores are higher than the female mean scores. Another significant finding of the research is that there is no gender difference with respect to inservice teachers' competencies. Moreover, there are statistically significant differences in preservice teachers' competencies according to their secondary school educations.

According to the results of the questionnaire about factors affecting technology integration in schools, preservice and inservice computer teachers acknowledge that there are many factors (mostly barriers) that contribute to successful technology integration.

It is clearly seen that qualitative findings of this study which were collected through interviews, observations and document analysis are in some cases supported with quantitative findings. On the other hand, in some cases contradictions are observed to exist between quantitative and qualitative results.

Regarding qualitative findings following themes were extracted and from participants' views and observations

1) Perceptions

- Perceptions about students' learning or roles (how students learn, what their reactions are.
- Perceptions about teaching in general
- Perceptions about computer teaching

2) Competencies

- Pedagogical competency
- Subject matter competency

3) Factors computer teaching influencing

4) Satisfaction

- Contextual satisfaction
- Professional satisfaction

CHAPTER 5

CONCLUSION AND DISCUSSION

5.1. Introduction

The purpose of this study was mainly to investigate preservice and inservice basic education computer teachers in terms of their perception of teaching and competency in pedagogic and subject matter knowledge. In this chapter, the major findings and conclusions related to the research questions are discussed based on the related literatures. At the end of the chapter, implications for practice and further research are presented. More to the point, the scope of the present study is broadened with both quantitative and qualitative analysis. Findings of the quantitative data are supported by qualitative data collecting methods (e.g., interviews and observation) in order to thoroughly understand inservice and/or preservice teachers' professional growth in terms of perception of teaching and competencies. Therefore, in the following, quantitative and qualitative findings are combined and discussed with related literatures. Moreover, these findings lead to derive generalizations for this broad study.

5.2. Background of the Computer Teachers

Results of the study indicated that the majority of the preservice computer teachers who participated in this study were male. The reason behind the male majority of the students studying at CEIT department may be the name of the department. Males might have preferred this department more than females because computer teaching department is generally regarded as a technical department. Another reason may be the fact that the majority of the students in the department come from vocational high schools, whose student population is usually male.

Apart from this, it can be stated that computer teaching department is a popular and a frequently preferred department. This can be understood from the fact that the majority of the students in the department preferred this department among their first five choices in the university entrance exam. The reason why the majority of the preservice teachers are graduates vocational high school can be the additional points given to vocational high school students in the university entrance exam. Besides, the fact that vocational high school graduates are more acquainted with computers than others may be another reason why this department gets their attention.

Analyzing the data of the research, result illustrates that the majority of the participants come from relatively middle level socio-economic backgrounds. For example, the mothers of preservice teachers are generally housewives and primary school graduates while the majority of the fathers are retired or civil servants and almost half of them are primary school graduates. In terms of the education levels of the parents, the percentage of the fathers holding a higher education degree is higher when compared to mothers. Similar studies conducted previously also indicate that the socio-economical status of preservice teachers is intermediate level in Turkey (Çelikkaya, 1999; Demirel & Kaya, 2005). Similarly, the findings of the research conducted by Seferoğlu (2004) about the prospective teachers of CEIT department at Hacettepe University show similarities with this study. According to the results of his study, the vast majority of the students at the CEIT department are males. Moreover, in his study the majority of the senior students at the CEIT department are above 20 years of age. Moreover, the majority of the students are vocational high school graduates. The students who chose CEIT department in their first 10 options form the majority (65%).

Another interesting result of this present study is that the majority of the inservice computer teachers have only two or three years of experience. This could be an indicator that CEIT departments are newly established in Turkey. However, interestingly, developed countries do not have similar departments in teacher training programs (Law & Plomp, 2003).

Besides, the socio-economical status of the parents of inservice computer teachers is very similar to preservice teacher's parents. It is also noteworthy that most of the parents are not university graduates. In the related studies about what kind of a teacher a preservice teacher will be in the future, Mahlios and Maxon (1995) observed that the preservice teachers are influenced by their own experiences as students (e.g., their relations with their teachers) apart from family history (e.g., the socio-economical status of the family), the social environment they live in, the values they hold, the attitudes to the profession of teaching, and their points of view of education in general.

5.3. Perception of Computer Teaching

Based on the results of the study, preservice and inservice teachers have both positive and negative opinions about the profession. According to preservice teachers' responses, although computer teaching as a fun and easy profession, they consider that the conditions of computer teaching are not very appealing and should be recovered. Similarly, Koca & Sen (2006) underline the importance of liking the profession in their study.

This study also reveals that computer teachers are not model teachers in schools or it can be said that they do not see themselves as model teachers. Based on their views, computer teaching is neither difficult field nor respected profession. Apart from this, the computer teachers at schools felt that other teachers perceived them as technical staff. In addition, both inservice and preservice teachers expressed this situation during the interviews. In the interviews, they stated that the computer teaching is needless and meaningless. On the other hand, preservice teachers perceived computer teachers as people who persuade students to research and to contribute the development of the technological knowledge of the society, since they are aware of the importance of using technology. Sharing this knowledge with other people motivates them for teaching. Related studies reported that preservice teachers' beginning opinions about the profession influence their beliefs and perceptions toward teaching (Pajares, 1992;

Taylor, 2006). Similarly, in a research on the preservice teachers in the department of mathematics Koca and Sen (2006) conclude that the preservice teachers under consideration like their department and that they have chosen this department because they believe they are good in this field. The same thing can also be said to be valid for preservice teachers in the CEIT department, based on their responses.

According to the results of this study, although, the preservice teachers' point of view concerning the profession is generally positive, it is noteworthy that there has been a change in the preservice teacher's perceptions of the profession over the years. For example, while the perception of preservice teachers in the sophomores is high, this rate decreases in the juniors and increases once more in the seniors. On the other words, preservice teachers are very excited and ambitious about computer teaching when they start first their study at the department. However, they lose this excitement over the years. In a study, Işıksal and Çakıroğlu (2006) observe that the interclass perception of the student teachers whose educational languages are English and who are studying at a good university in Ankara change in time. According to the results of their study, the perception of preservice teachers increases as they proceed from the first grade to upper grades. On the other hand, the researchers found that there is a significant difference of self-perceptions to mathematics according to the university they studied at and their grade levels in the university (Işıksal & Çakıroğlu, 2006). In this present study, it was observed that although the preservice teachers' perceptions towards the profession are not constantly rising, it changes over the years (Perception is high in second grade, low in third and highest in fourth grade). Similarly, in their study, Bullough & Knowles (1991) conclude that as student teachers progress through the program, connection among their prior beliefs, program knowledge, and classroom experiences appear to grow stronger. Some researchers point out that student teachers structure their lessons in a way that makes learning enjoyable (Maxson & Mahlios, 1994; Skamp, 1995).

Furthermore, when examining the previous studies about preservice teachers' views of the teaching, Kagan (1992) states that the opinions of preservice teachers before starting their profession play an important role in their professional career. Moreover, in related studies, the perceptions towards the profession generally do not change or increase positively (Kagan, 1992; McLaughlin, 1990). In a study, for example, aimed for preservice teachers to evaluate themselves, McLaughlin (1990) found that the opinion and perception of being successful in the profession does not change over the years in the program. In other words, the first opinions of preservice teachers continue with the same stability or they change positively. In studies (Dunkin 1996; Grosman 1992; Nettle 1998), however, it is claimed that there is a change of perception in preservice teachers over the years. Likewise, in a study Weinstein (1999) found that although field experiences and pedagogical knowledge of preservice teachers increase, their teaching perceptions do not change over the years. Their perceptions are positively high about their future professional careers.

Pigge and Marso (1989) conducted a study on the effect of experience on professional growth. They investigated the professional growth of preservice teachers as their student years' progress in the program. According to the results, preservice teachers reported that as the program progressed, their own insufficiency disappeared and they gained more knowledge about the class atmosphere. Their attitude towards teaching remained positive and their opinions of being successful in the profession stayed optimistic over the years.

On the other hand, Florio-Ruane and Lensmire (1990) found that preservice teachers begin the education program with clear images. As they begin classes, preservice teachers have ambiguous opinions about the characteristics of their students. In their study, teachers confirmed that there was not a change in their individual opinions until they start of teaching practice.

In another study conducted among 79 preservice teachers, Nettle (1998) examined preservice teachers' opinions of teaching before and after their teaching practice. According to the results, there has not been a change in most of the preservice teachers' perceptions about teaching, but there has been a change in some of the candidates in some sub-dimensions such as activity organizing and motivation

Similarly, studies in the literature show that teaching experience has a great effect on student teachers' perceptions about the teaching profession. Thus, related research has emphasized that time is needed in order for the teacher to develop them professionally and to have a positive attitude (Koca and Sen, 2006). Another study conducted by Lowery (2002) indicates that more time in the field would help teachers develop professionally and acquire positive attitudes. However, some other studies (Cooney, Shealy & Arvold, 1998; Mewborn, 1999) underline that field experiences and student teaching have more profound influences on creating both positive and negative beliefs towards teaching.

In the present study, surprisingly, the perception of inservice teachers is lower than seniors' perception. Inservice and preservice teachers also highlighted this situation during the interview part of this study. They suppose that nobody should become a teacher in order to introduce only a part of a machine, computer. Actually, they want their present roles either to be changed or revised. Teachers also express that their interest towards the profession is decreasing day by day. Results show that they are not as curious and ambitious towards teaching as they used to be at the beginning and their opinions changed over the years.

Besides these, in the related literature conducted about teachers' professional growth, it is emphasized that positive thinking about the profession is one of the characteristics of good teachers (Fajet et al., 2005; Minor, et al., 2000; Reed & Bergemann, 1992; Segall & Wilson, 1998; Weinstein, 1989, 1990; Witcher et al., 2001). In other words, knowledge and perception of preservice teachers before starting a school is a marker of their professional growth. When the perceptions of teachers are high, their performance in teaching accordingly becomes high, too. According to Bandura (1977, 1986), when preservice teachers find themselves as competent in mathematics, this positively affects their teaching practice. In a study with 120 preservice teachers, Fajet et al. (2005) determine the characteristics of a good teacher. According to the results of the study, what make a good teacher are (1) being affective and having good personal characteristics; (2) their pedagogy/classroom management; (3) her/his attitudes and behaviors toward students; (4) their attitudes toward job/teaching in general; and (5) her/his knowledge of subject matter. Fajet et al (2005) conclude that good teachers are also seen as indicative of eagerness for the profession. On the other hand, some researches (Chen & Ennis 1995; Koca & Sen, 2006; Raymond, 1997; VanLeuvan, 1997) show that it is not enough to have strong subject knowledge competency and strong beliefs or perceptions to be good teachers in the classroom. When teachers begin to teach, they generally undergo difficulties due to their existing knowledge and perceptions.

Besides, according to preservice and inservice computer teachers' opinions, factors such as students' interest in technology, their attitudes in the laboratory, and their attitudes to the computer lesson affect the their attitude to and interest in the profession. For example, during the interviews and observations, students enjoy the computer games and they want to play computer games when they entered the computer lab. Therefore, by taking into account the attraction of computer games for children, studies and projects on ways to use these kinds of educational games in education might be carried out (McDonald & Hannafin, 2003; Michael, 2001; Mitchell & Fox, 2001).

Based on the results of this study, it was observed that although the perception of male teachers is more positive than that of the female preservice teachers' perception, a significant difference between the two groups could not be found. An explanation to this could be that male teachers can work better because they are more familiar with the computer teaching atmosphere and can better understand the needs of the students. Moreover, the computer laboratory atmosphere has a decreasing effect on the perception of female teachers, since the lab environment is difficult for female teachers. On the other hand, preservice teachers also affirmed this situation in the interviews indicating that teachers who are vocational high school graduates can adapt to the atmosphere better than those who are not. There are similar studies in the literature about the relationship between teacher perception and gender. Saban (2003), for example, has found parallel results about the perceptions of the elementary teaching as a profession in his study. Indeed, according to the results of his study, there is no difference between male and female teachers in terms of feelings about teaching. Moreover, some studies report that female teachers have higher teaching concerns than males (Ghaith & Shaaban, 1999; Üredi, 2006).

Results of this study prove that most of the preservice teachers place CEIT department among their first five choices in the university exam. This is an indication of the preservice teachers' choosing this department at their own wish or free will. Therefore, this result shows that preservice teachers have a high perception towards their profession in the first years of the training. In the interviews, teachers confirmed that they chose their department consciously and willingly. In the related literature, researchers support that teachers have an expectation directed to their own thoughts and opinions for their future careers (Kagan, 1992; Weinstein, 1989, 1990)

Based on the results, it is also of noteworthy that the preservice teachers' perceptions towards the profession among the universities are also different. For example, the preservice teachers at METU, which is one of the most eminent universities in Turkey, have a lower perception of the profession compared to the perceptions of students at other universities. The reason for this might be that the students at METU have opportunities to work at other fields such as software companies. Technopolis companies in METU providing the students with this opportunity could be said to be another reason. This can be seen in the preservice teachers' opinions in the interviews. However, it is very interesting that preservice teachers of Baskent University have higher perceptions towards the profession. The small number of participants from this university could be given as a reason for this. Similarly, Işıksal and Çakıroğlu (2006) found that there are no significant differences in perceptions toward teaching mathematic among students at different universities and different grade levels as well as between preservice and inservice teachers. They also state that the teaching programs in Turkey showing similarities on the basis of content are a reason for the similar results.

5.4. Pedagogical Competencies

Teaching is a highly complex activity which includes lots of knowledge (Arends, 2001; McNamara, 1991; Mishra & Koehler, 2006; Shulman & Sykes 1986). According to Shulman (1987) there are clearly two main domains of teachers' knowledge which are subject matter knowledge which is knowledge and understanding of the subject itself and pedagogic content knowledge which is knowledge about how to apply the subject when teaching. Studies that examine preservice teachers' knowledge of subject matter and pedagogical knowledge indicate that a majority of those studied have only a mechanical understanding of the subject they will teach (Mishra & Koehler, 2006; Zeichner & Gore, 1990). Researchers also claimed that prospective teachers know the rules to follow, but cannot explain the rationale behind the rules.

In this study, the results illustrated that the preservice teachers' competencies show an increase throughout the program over the years. On the other words, preservice teachers become more and more self-confident over the years, as they take the pedagogic courses in the university. Similarly, a study conducted by Nettle (1998) indicates that the lessons given in universities contribute to students' progress in the profession. Some studies on professional growth conducted among preservice and first-year teachers suggest that teacher training courses can help preservice teachers' focus on issues related to teaching and learning of academic content dimensions of teaching (Ball, 1989; Clarke & Hollingsworth, 2002; Comeaux & Gomez, 1991; Feiman-Nemser, McDiarmid, Melnick, & Parker 1989; Florio-Ruane, Mosenthal, Denyer, Harris, & Kirschner, 1990; Grossman, 1990).

On the other hand, based on findings of this study, the pedagogical competencies of preservice teachers increase over the years and they feel themselves quite competent when they come to the last grade. However, it could be said from the interview and observation results that they feel inadequate in terms of competence in some cases. For example, the survey and interview results show that preservice and inservice teachers face some difficulties on the issue of measurement and evaluation. The reason for this might be that, the measurement and evaluation of the students in the computer lab require practicing, since computer classes are practice-based. Moreover, teachers do not have the enough time to achieve this or they do not have the opportunity to use suitable measurement tools for the assessment of the student. It is also seen from the observations that they encounter difficulties in developing and using the suitable measurement tools during teaching practice. In his study, Seferoğlu (2007) points out that teachers encounter difficulties on the measurement and evaluation parts especially in the newly prepared curricula. Similarly, Calderhead and Robson (1991) observed that preservice teachers have insufficient knowledge for fulfilling the lesson requirements in the teaching practices. They claim that teachers' pedagogical incompetencies in meeting the needs of the students lead to some problems in class.

Regarding pedagogical issues, the opinions of the preservice and inservice computer teachers about the lessons in the computer laboratories can be summed up as in the followings:

- Time is limited to perform the pedagogical requirements.
- The teachers should communicate with the students effectively.
- The computer teachers should prepare teaching materials rather than just teaching about the computers.
- The designs of the classrooms are problematic.
- Classroom management is a challenge.

Moreover, in the interviews and observation it was observed that computer teachers faced difficulties with the setting of classroom and discipline in laboratories, and that particularly the design of the computer classes complicated communication with students. Giving some extra courses (e.g. child psychology, educational psychology, and educational philosophy) related to pedagogical and subject matter as well as training on measurement and evaluation might be a solution to this problem. These could be shown as an indicator of the students' not finding themselves competent enough at a certain issues. This result coincides with Chen & Ennis's (1995) idea that the transfer of content knowledge is important and it will be much more meaningful if it is compatible with pedagogical knowledge. Some researches (Adams & Krockover, 1997; Darling-Hammond, 2000; Felter, 1999; Grossman, 1989) who conducted about pedagogical preparation studies conclude that the variety of courses such as theoretical foundations of education, learning theory, instructional methods, and classroom management preservice teachers take during the university education have positive effects on their performances as well as on student achievement.

Furthermore, based on computer teachers' views the theory lessons in schools are very different from what confronted in real life. In their study with 12 preservice teachers, Calderhead and Robson (1991) observe that teachers find it difficult to adjust what they have learnt in university to various situations and students' needs. Similarly, Aitken and Mildon (1991) monitored a 4-month teaching experience of 4 preservice teachers in Canada and observed the difference in their competency and perceptions. Based on the results of their study, preservice teachers have stated that the lessons in schools have far too much theory. They also claimed that enough time is not given to practice. Besides, according to Chen (2002), when teachers start teaching in classes, they generally have a different view compared to their previous opinions. They try to adapt to the class atmosphere, let alone the things they have seen or know. Similarly, according to Fennema and Franke (1992), mathematics teachers' pedagogical and subject matter knowledge along with student attitudes are effective on their perceptions. Grossman (1992) also states that teacher education programs do not correspond to the existing teaching context and thus they should follow current practices and update themselves. Moreover, Hoy and Woolfolk (1990) observe that as preservice teachers' teaching experiences increase, they can develop their own perspective of teaching. They claim that preservice teachers' perceptions of teaching develop as they prepare themselves well to teaching and get accustomed to it.

More to the point, experience is very important in teaching and thus school experience and teaching practice which can provide them with this experience must be taken much more into account. Detailing the argument above, Eisenhart et al. (1991) conducts a study with 8 preservice teachers and concludes that there is a major difference between the experience and perceptions of preservice teachers and what is expected from them. Preservice teachers are expected to behave like experienced teachers and to adapt to the school culture immediately. According to Eisenhart et al. (1991) study, professional growth of preservice teachers should not be ignored and must be focused on in universities. These suggestions also might be taken into account in current situations. Experience in teaching is very crucial and, as such, teachers should be experienced in teaching before they start teaching at schools. This experience might be gained in the university years and by closely following the developments in the inservice training. Eisenhart et al. (1991 also suggest that class atmosphere and conditions must be provided in order for practical experiences and applications to include real applications of educational theories in the teacher trainings. They also state the following requirements for teachers' professional growth:

a) Opportunities for integration of subject matter in a classroom teaching experience,
b) Preparing preservice teachers personally and professionally,
c) Providing experiences that give prospective teachers an opportunity to try out their skills and abilities (Eisenhart et al., 1991)

Apart from this, inservice teachers emphasized the importance of experienced teachers sharing their know-how with preservice teachers in universities. Such sharing of knowledge might increase prospective teachers' behaviors positively before starting teaching. The importance of sharing knowledge is also elaborated in related studies in the literature. For example, in their study Ross and Smith (1992) have observed that listening to the professional practices of experienced teachers has a positive effect on the professional growth of preservice teachers. Based on their conclusion, experienced teachers passing on their professional expertise to preservice teachers play an important role on their motivation to the profession.

According to the results of this study, interestingly, pedagogical competency scores are varied from the universities to universities For example, on the pedagogical competencies, students of Ege University feel themselves pedagogically more competent than the students of other universities. Baskent University students seem to have the lowest score in terms of pedagogical competencies. The reason why students of some universities feel themselves more competent than others should be studied in a further research.

Regarding gender, based on the results, although female preservice teachers see themselves to be pedagogically more competent than males, it is seen that there is not a statistical difference between males and females. There are body of studies in literature (Chapman & Lowther, 1982; Charters,1970; Minor, Onwuegbuzie, Witcher & James, 2002; Stevens, Wood, & Sheehan, 2002; Peretz et al., 2003) indicating that females willingly choose and like the teaching profession and that they are especially good in the field of pedagogy

With regard to the secondary schooling of the preservice teachers, those who graduated from Anatolian vocational and technical high schools feel themselves more competent on both pedagogy and subject matter than those who graduated from other high schools. This is because preservice teachers who graduated from these schools are much more familiar with computers and computer laboratories than others are. Similarly, according to the study of Akkoyunlu and Orhan (2003), because the students of CEIT come from different school varieties and the students graduated from vocational high schools are more competent about computer skills, courses about computer skills should be given in a different form to the students graduated from schools other than vocational high schools. In other words, students other than those coming from the computer departments of vocational high schools could be given with additional studying hours at computer labs for practice and with more implicational courses to provide them for theoretical and technical support.

5.5. Subject Matter Competencies

Based on findings, preservice teachers' subject matter competencies got higher across their years in their teacher education programs. Preservice teachers' having a high competency level on the field of subject matter may be because most of the preservice teachers are coming from vocational and technical high schools. Therefore, they are already educated on many basic subjects in vocational high schools.

Moreover, results clearly show that preservice teachers feel themselves quite competent on certain issues such as setting up computer software, updating it or deleting it from the computer and system settings. However, preservice computer teachers are not so good at issues like researching and updating themselves. If the research courses are given in universities, then preservice teachers might be informed about the subjects of updating themselves. Apart from that, preservice teachers frequently indicate that professional development and inservice training must be given in order for them to develop and update themselves. This can be verified with the fact that because courses on research are not given in universities, teacher candidates are not aware of how to develop themselves and follow the progress in technology.

Seferoğlu (2004) found similar results that preservice teachers perceive themselves insufficient on the issue of their level of competency related to serving students who need special education. He connects this result with the fact that there are not related courses in the university curricula. He also suggests that the MoNE has to continuously overview these competencies and that it would be good if certain concern special competencies were set. Apart from this, according to the results of his study, the self competency beliefs of the students related to computer using is 4.05 (out of 5).

Parallel with the ISTE standards for teachers (2000), teachers should be able to apply technology in assessing student learning of subject matter using a variety of assessment techniques. Besides, if teachers use technology resources to collect and analyze data, interpret results, and communicate findings to improve instructional practice and maximize student learning, they will be able to apply multiple methods of evaluation to determine students' appropriate use of technology resources for learning, communication, and productivity (ISTE 2000)

Moreover, Fajet et al. (2005) emphasize that the lessons in the teacher training programs should be organized to develop preservice teachers' knowledge and thus promote their professional growth. In recent studies, the subject matter and pedagogical competencies are seen to have a strong connection with teachers' performance and in-class teaching practice (Darling-Hammond, 2000; Goldhaber & Brewer, 2000; Guyton & Farokhi 1987; Minor et al., 2000; Monk, 1994; Witcher et al., 2001; Koca & Sen, 2006; Weinstein 1989, 1990). These studies also put forward that incompetent subject matter prevents being a good teacher in the classroom.

Moreover, based on computer teachers' views, computers should be used in other lessons in schools as well. Students should use computers in computer courses but in other classes as well. Therefore, the other teachers in schools should cooperate with the computer teachers to find a way to adapt computers and technology to every lesson. In other words, computer teachers might be serving in schools as technological consultants or advisors instead of solely as computer teachers, and they can support and help other teachers on using technology effectively in class. The computer laboratories in schools should be open outside of school hours and thus both students and teachers should be provided with the use of technology outside of school hours. It is possible to say the same things when looked at the applications of information technologies in developed countries. The students in these countries can use technology in every class and whenever they want (Becta, 1998; Hepp, Hinostroza, Laval & Rehbein, 2004; Law & Plomp, 2003; Mentz & Mentz, 2003). Besides, to follow regularly technological developments, especially inservice training programs might be organized and an internet portal must be arranged specifically for them to utilize technology more efficiently. While using technology, taking into account the ethic is another important view of teachers. Based on computer teachers' thoughts, students should be taught on how to reach correct information and how to use it. Teachers, especially computer teachers, are responsible about ethical issues in the use of technology in the schools. Moreover, ISTE determines the technology standards for teachers. According to these standards, teachers should be able to promote safe and healthy use of technology resources and facilitate equitable access to technology resources for all students (ISTE, 2000). Gore and Zeichner (1991) also conclude that teacher educators must focus students' attention on ethical issues. Studies of professional growth among preservice and first-year teachers suggest that teacher education coursework can help prospective teachers focus on issues not only related to teaching and learning of academic content but also to the ethical dimensions of teaching (Grosman, 1992).

Another interesting result in the competency of the subject matter is that although the same courses are taught in all the universities under consideration, there are differences in terms of competency among the preservice teachers from different universities. For example, students from Başkent University perceive themselves more competent than students at other universities. On the other hand, students from 19 Mayıs University feel themselves more incompetent than the students of other universities. This difference among universities is an issue of further and detailed research.

Regarding gender differences, result shows that male student teachers see themselves better than female students do on the field of subject matter knowledge. The reason behind this is probably due to their feeling superior to female students on the subject of technical issues. In other words, since the major focus of preservice teachers in terms of subject matter is on computer hardware and software programs, males are seen to have a better aptitude for the profession.

According to result, vocational Anatolian and vocational high school graduates feel more competent than graduates from other schools on the field of subject matter. The reason behind this is that technical courses such as computer hardware, software are given in these vocational schools and students graduated from these schools are more familiar with the computers. However, this situation also has its drawbacks. Students who are not graduates of vocational high schools encounter difficulties in the beginning and it is difficult for them to adapt to their department.

More to the point, when preservice computer teachers finish their university education, they become competent both in subject matter and in pedagogic domains. Arends (2001) advocates, teachers are expected to have advanced preparation and demonstrate their knowledge of both subject matter and pedagogy. Moreover, one of the most consistent findings concerning teaching is that effective teachers maintain a balance between specific strategies designed to manage student behavior in the classroom and instructional strategies (Cahill & Skamp, 2003; Feiman-Nemser & Parker, 1990; Gilberts & Craft, 1997; Schallcross & Spink, 2002). Moreover, according to Geddis and Wood (1997), knowledge transformations depend on teachers' capacity to recognize and manage dilemmas in the practical context. Since they will one day be computer teachers in schools and one of their most important roles will be to integrate technology, especially computer technology, into their lessons, they must be competent both in the subject matter and in pedagogic domains before becoming teachers.

In a study on competency that Mahiroğlu (2004) conducted among 190 preservice teachers from different faculties in Gazi University, according to preservice teacher's self-assessments, although their competency level changes from one competency to the other, in most competencies, their total good and excellent competency level score is above percentage 80. According to the results of his study, Mahiroğlu also argues that faculties and educational staff that are concerned with teacher training should develop competency exams that can better determine preservice teachers' competencies by reviewing the education program and applications in terms of the related research results.

Likewise, the MoNE should consider these results when inspecting teachers daily and periodically and when planning inservice training. Without competent teachers on the subjects and the process of education, no educational and industrial education program can be fully successful (Miller & Miller, 2002; Fajet et al., 2005).

In the studies related to professional competencies, being competent in their fields is accepted as an important characteristic of good teachers. With respect to professional competence, good teachers are generally thought to have sufficient knowledge of the content areas in which they teach (Minor et al., 2000; Reed & Bergemann, 1992; Segall & Wilson, 1998; Skamp, 1995; Weinstein, 1989, 1990; Witcher et al., 2001). Good teachers are further able to clearly impart their knowledge to their students (Minor et al., 2000; Reed & Bergemann, 1992; Segall & Wilson, 1998; Skamp, 1995; Weinstein, 1989, 1990; Witcher et al., 2001).

According to Chen and Ennis (1995), the relationship between teacher's content knowledge and curriculum must be compatible with each other in order for the teacher to transfer knowledge. They conclude that although subject knowledge is similar with everyone, pedagogical knowledge can only be developed individually. Apart from that, the teacher's pedagogical and subject matter knowledge development depends on the perceptions on the students' learning skills. Likewise, teacher preparation programs must be compatible with the curriculum used in classes and subject matter. The results in literature are similar to the findings of this study. Similarly, Kagan (1992) and Grosman (1992) emphasize that for pedagogical and subject matter competencies to provide professional development, they should be understandable and compatible with each other. Moreover, it is stated in studies that pedagogical preparation and competencies, including preparing for the lesson, teaching methods, classroom management and student assessment have a positive effect on teacher performance (Adams & Krockover, 1997; Darling-Hammond & Snyder, 2000; Vali & Rannert-Ariev, 2002)

5.6. Computer Teachers' Opinions on Factors That Contribute to Successful Technology Integration in Schools

Understanding the general views of basic education computer teachers about successful technology integration is very crucial to use technology in the classroom. More to the point, it is important to understand preservice teachers' thoughts about technology integration because they will be the future computer teachers in Turkey. Moreover, another essential piece of information that can be obtained from this study is the awareness of the preservice and inservice computer teachers regarding the importance of integrating technology during teaching and learning activities.

Based on the results of this study, preservice and inservice computer teachers acknowledge that there are many factors (mostly barriers) that contribute to successful technology integration. These factors can be summarized as follows:

- Limited access to technology (e.g., computers) in schools
- Crowded classrooms
- Number of computers in labs
- Teachers' attitude toward technology
- Teachers' knowledge and competence about technology integration
- Lack of software and hardware
- Lack of training in how to use technology
- Lack of time to implement technology-based lessons in the classroom
- Lack of up-to-date technological tools

These results are generally supported by other studies that focus on technology integration. For example, Brush et al., (2003) found that although preservice teachers' perceptions towards technology are positive, they mention similar barriers while integrating technology into the teaching activities. Granger et al. (2002) also report similar findings. They investigate the factors that affect the implementation of technology into the classroom activities as perceived by the preservice teachers. They specifically sought to answer the following questions: (a) What factors do teachers perceive as contributing to successful classroom implementation of ICT? and (b) How do these factors act, and interact, to make their contributions? They found that multiple factors affected the implementation of new technologies: these were the modes of learning, characteristics of teachers-as-learners, and ideological issues in schools and communities (Granger et al., 2002). Similarly, Becta report (2004) yielded following results: on-site technical support, programme of staff ICT training and whole school policies on using ICT across curriculum were important factors while integrating technology into classroom practices. Moreover, studies in the literature suggest that curricula should be designed on the principle that teachers and students should use ICT as an inevitable tool for their learning and teaching activities (Ortega & Ortega, 1995; Vrasidas & Mclsaac, 2001; Yildirim, 2007).

As it is discussed, most of the previous studies that focus on teachers' ideas on technology integration in the literature are about inservice teachers, and studies that focus on preservice teachers are very few, if any, in number. Therefore, the current study might be helpful in shedding some light on the preservice teachers' views about technology integration, because they will be teachers in the future and they will be mainly responsible for technology integration in curriculum. The same situation holds true in the Turkish case as well; as far as observed, there is no other study in the literature that examines the ideas of preservice teachers on the technology integration in Turkey. An example from Turkey is the study of Çağıltay, Çakıroğlu, Çağıltay, & Çakıroğlu (2001), who investigate inservice teachers' ideas on technology integration. Actually, their findings about technology integration are generally in line with the findings of the present study. They investigate teachers' perceptions about using computers in schools. As their results show, teachers believe that the use of computer technology in schools is beneficial for teaching and learning activities. However, they found that inservice teachers' competency is generally not adequate to integrate technology. In the present study, preservice teachers believe that their education is sufficient to integrate technology into the classroom practices. This situation might be, mostly, due to the characteristics of participants, who were computer education students. Therefore, similar studies should be conducted by recruiting participants from other departments (e.g., science education, math education, language education). This might enable us to see what other preservice teachers think about the integration of technology into classroom activities.

Another study worth noting was conducted by Yildirim (2007). This study gives recent information about teacher's current use of information and communication technology (ICT) in the Turkish basic education schools and investigates the barriers that affect technology integration. Yildirim concludes that most teachers did not use ICT to encourage students' accomplishment in areas across the curriculum. Moreover, according to his findings, teachers feel that overcrowded classes, inadequate inservice training, lack of timely technical and pedagogical support, inflexible school curricula, lack of incentives, lack of strong leadership, and lack of collaboration among teachers are the most negative factors affecting successful technology integration in schools. It is clearly seen that these results are in parallel with the findings of the present study. Moreover, the findings of Yildirim's study clearly show that the success of the Ministry's current endeavor to introduce ICT to basic education schools largely depends on teachers' collaboration and their active involvement in the integration process. To that end, the MoNE and its authorities should develop and employ new policies to cause teachers' involvement in the decision-making and planning processes. In addition to this, the teachers should have some opportunities such as 1) appropriate preservice and inservice training, 2) being led by a powerful leadership 3) being provided with necessary incentives, and 4) being provided with technical and pedagogical support.

For the effective use of technology in classrooms, the barriers that have been discussed so far should be eliminated by the educational authorities, such as directors of schools and administrators in the MoNE. Moreover, teacher education programs should provide technology training for prospective teachers (Yildirim, 2000), and also prospective teachers should be familiar with new technological developments so that they can effectively address issues that might emerge while they are using technology in the schools they are going to work. Granger et al. (2002) argue that lack of appropriate material resources would inhibit learning and might cause frustration and resistance in school communities. Similarly, Ertmer's (1999) study found that even under very favorable conditions, 40% of the educational practitioners still indicated that lack of hardware was a major obstacle for technology integration. Besides, schools should prepare a technology plan (Cradler, 1996) to determine their needs for using technology effectively (Barnett, 2001). Since technology is growing rapidly, creating opportunities for professional development for both inservice and preservice teachers is essential to catch up with advancement in technology. The findings of Ertmer's (1999) study reveal that qualification of ICT support staff in the school is beneficial for the staff development of teachers. Likewise, Mathews et al. (1996) reports that professional development is needed to enhance teachers` ability to use technology.

5.7. Factors Affecting Teaching and Professional Satisfaction

Based on results of the study the factors that encourage/discourage preservice and inservice computer teachers to work at schools are as follows:

1) The following major factors influence teachers' performance as computer teachers: a) the outdated of the curricula b) the scarcity and the unusefulness of the computers c) the teachers' being made use of as technical service staff d) the time limitation e) the attitudes of the school administrators f) the attitudes of the students and their parents towards the computer courses and the computer teachers.

2) There are formators in the schools who are not very qualified at computers and technology.
3) The organization of the computers in the computer laboratories is as important as the number of the computers for the efficiency of the lessons
4) Many times students do not take computer classes seriously, because computer classes are optional courses in schools. This situation also leads to dissatisfaction and uneasiness on the part of the teachers.

It is worth noting that although preservice and inservice teachers share similar opinions about the encouraging or discouraging factors in schools, there are some differences as well. For example, according to inservice teachers, the definitions and roles of formator teachers must be clearly set or more useful implementation must be provided by cooperating with them. Moreover, the roles and responsibilities of these teachers should not be confused with the responsibility of computer teachers, and the tasks relevant to computer teachers should not be assigned to these formator teachers. It is even possible to say that Provincial National Education Administrations, computer teachers, computer formators, other branch teachers and school managers share the common view on the positive impact of using technology on students' outcomes. To that end, all these stakeholders must interact with each other for the effective use of technology in schools. This implementation will not only benefit the students but also the parents and community.

These aforementioned factors affecting the teaching practice also affects the professional satisfaction of preservice and inservice teachers. These factors can be categorized into two as follows: Environmental satisfaction and professional satisfaction.

The factors affecting teachers' professional satisfaction can be summarized as in the following table

Table 5.1 *Affect of the satisfactions of the preservice and inservice teachers*

	Environmental satisfaction	**Professional satisfaction**
Preservice teachers	• The organization of the computer laboratory • The number of computers • The students' interest in the course • The drawbacks of the computer labs • The outdated curricula	• The indifference of the other teachers at schools • The computer teachers' salary • The difficulty of catching up with the technology • KPSS exam • The opportunity to work in private sectors
Inservice teachers	• The organization of the computer laboratory • The number of computers • The students' interest in the course • The drawbacks of the computer labs • The outdated curricula	• The computer teachers' role • The computer teachers' salary • The difficulty of catching up with the technology • The opportunity to work in private sectors

Based on teachers' views neither students nor their parents pay attention to the computer teachers, and parents do not see them worth speaking when they come to the parents and teachers meeting. Computer teachers also stated that great expectations from them influence their effectiveness in the school. According to their expression, the principal, the students as well other people from outside of the school think that computer teachers make them familiar with all innovations.

These results are also supported in the previous studies. For example, Deryakulu & Olkun (2007) analyzed computer teachers' online discussion messages about their job satisfaction. They concluded that uncertainty of the computer teachers' role, lack of technological infrastructure, outdated curriculum about the computer subject and insufficient educational policies were the most frequently mentioned troubles among the computer teachers. Similarly, Kagan (1992) emphasize that the individual and contextual factors affecting the professional satisfaction of those who have completed or who are about to complete the teaching program are as follows: 1) obtaining sufficient amount of information about students; 2) effect of previous opinion and perceptions; and 3) reshaping them and adjusting them to the new environment. Moreover, Kagan (1992) claims that not fulfilling these factors causes to failure in teacher training programs among preservice teachers about adapting to new situations. Similarly, Grosman (1992) argues that as preservice teachers control their teaching routines, they become more satisfied of their own teaching. On the other hand, Ma & MacMillan (1999) conducted a study about the influence of workplace conditions on teachers' satisfaction. They found that workplace conditions, administration controls, as well as teachers' competencies affect teacher satisfaction. Hoy & Miskel (1991) confirmed that teachers' satisfaction is one of the important factors for achieving and evaluating their roles and performances in educational settings. In their study, Taylor & Tashakkori (1995) state that school climate is one of the significant predictors of teachers' job satisfaction. According to Reyes and Hoyle (1992), teachers' interactions with school principal is also an important issue for satisfactions. Teachers' perceptions also have an effect on their job satisfactions to achieve their objectives. Teachers' satisfaction also influences their students' performances (Spillane, 2005).

5.8. Implications for Practices and Suggestions for Further Research

This study portrays basic education computer teachers' professional growth in terms of their perception of teaching and their perceived pedagogical and subject matter competencies. Based on the findings and discussions, the following implications and recommendations are suggested.

5.8.1. Implications and Suggestions for HEC, MoNE and Universities

This study aims to reveal the existing status of the CEIT departments and the students who enrolled these departments. Therefore, results of this study present important information for HEC, MoNE as well as for teacher education programs by shedding light on the current situation. Furthermore, this study will guide educators and policy makers for preparing new curricula and programs to implement technology in education and for computer teacher training. To that end, the followings are suggested for implications and practices;

1) The result of this study indicates that although CEIT departments educate computer teachers, the format of these departments should be reconsidered. For example, there are no similar implementations in developed countries. They have technology coordinators or media specialist to integrate technology in to all classes.
2) Using technology becomes a central part of the teaching and learning process in every educational setting. Because of that reason, preservice computer teachers should regularly follow models and participate into projects of technology use both for developing their knowledge during their training and enriching their teaching practices. Moreover, the use of technology in universities within training programs should constitute an important part of the training. The elements listed below are of great importance in technology training:

- Sharing the vision
- Having accessibility
- Skilled educators
- Professional development
- Technical assistance
- Content standards and curriculum resources
- Student-centered teaching
- Assessment
- Community support
- Support policies (ISTE, 2000).

3) MoNE, HEC and the universities should be in cooperation on a regular basis. They should reevaluate the programs offered to computer teachers in order to ensure the efficient and effective use of technology.
4) For more effective technology integration in schools, large-scale projects should be implemented. In the context of these projects, various methods should be investigated to make the technology more efficient through the cooperation of the MoNE, schools, companies, and industries. For example, when computer games for children are considered, studies and projects should be developed in such a way that computer games become a part of education.
5) The results of this study demonstrated that the courses thought in universities are insufficient for training preservice computer teachers on classroom information procedures, and the student and school environment. Based on this, it can be suggested that the courses' contents be revised and updated each year by making the necessary changes.
6) In order to integrate technology into schools successfully, the program of the department can be extended by providing extra courses. For example, courses that will equip preservice teachers with the skills to design lessons involving appropriate technological tools that will cater for the needs of mentally and physically handicapped students can be offered. Moreover, such courses as alternative measurement techniques, child psychology, and educational psychology should be offered.
7) The period allocated for teaching practice should be extended by providing preservice teachers with the opportunity to spend more time in their work environment, which will enable them to gain more experience. In other words, they will have the chance to put their theoretical knowledge into practice and reflect on it. As a result, they will be able to anticipate problems and they will develop strategies to cope with them.
8) Taking into account the indispensability of the use of technology in schools and the rapid development technology, by receiving regular inservice trainings, computer teachers should be able to keep up with cutting-edge technology. To

achieve this, professional development programs and updates of these programs should be offered to teachers on a yearly basis.

9) When we look at the majority of the students in CEIT departments, it can be observed that most of them graduate from vocational high schools. Being a vocational high school graduate is regarded as an advantage during the first year especially in the technical courses offered in the department. On the other hand, students who graduated from other high schools are disadvantaged, because they are not as familiar with technological jargon as their classmates. This has a negative effect on their motivation and performance in the course. In order to overcome this problem, these students' motivation should be raised by offering them extra workshops aiming to compensate their deficiencies.

10) Regarding ethical issues in technology use, computer teachers should be able to promote safe and healthy use of technology resources for all students. To that end, preservice teachers should get information about the ethical issues in their training programs. Moreover, inservice trainings programs should include this issue as well.

11) The job descriptions of computer teachers should be reconsidered in schools. Instead of viewing the technology just as composed of the computer and its parts, they should better serve with an eye on finding better ways to integrate the technology into all courses and to make better use of it. For this purpose, one of the most important ways to provide more efficient use of technology is to be in constant cooperation with the other teachers in the school. More to the point, the computer teachers should serve as consultant teachers in schools just as developed countries do.

12) The professional growth of preservice teachers should not be disregarded, and especially the universities, by placing the focus on this issue, should constantly follow their progress. To that end, they should teach them better by introducing reform where necessary. In order to maximize the level of efficiency in teacher training, importance should be given to such large scale studies that will increase the level and the quality of teacher training. In addition, the responsible

authorities who prepare the programs should definitely take into consideration the perceptions and beliefs of teaching and the competencies of both inservice and preservice teachers.

13) The content of the computer courses provided in K8 schools should be revised and updated each year by the MoNE. That is because as the technology develops rapidly, the software used loses its up-to-datedness.

14) In national exams like SBS (Seviye Belirleme Sınavı) there should be questions from the field of information technologies so as to increase the interest of students in this course and field.

5.8.2. Implications and Suggestions for Schools and Teachers

Results of this study give important suggestions for school administrators to integrate and use technology appropriately and effectively in teaching and learning activities. Moreover, important suggestions are made to computer teachers to be not only good teachers but also effective technology integrators in schools. The followings are suggested for school administrators and computer teachers:

1) The efficient and effective use of technology cannot, apparently, be guaranteed just by providing technological tools for schools. Schools should carry out a need assessment in order to determine their requirements to use technology.
2) Schools administrators should develop a technology plan; they should accomplish mission and vision studies according to this plan, and determine the required steps for the efficient use of technology.
3) Some important points (e.g. studying collaboratively) should be taken into consideration for more efficient and effective use of technology in schools. Especially, the computer teachers, who are responsible for this issue in schools, should work in coordination with the other teachers in the school as well as the school administration.

4) In order for the effective use of the IT classes, necessary facilities should be provided for the teachers and the students. In fact, these classes/laboratories should be accessible in off-school hours, which is of great importance for the efficient use of and access to technology by teachers and students in their learning and teaching processes.
5) The course hours should be increased and IT labs should be accessible for other courses.

5.8.3. Suggestions for Further Research

In addition to suggestions and implications for practices, following recommendations are presented for further research;

1) Based on the results of this study, there are some factors that affect the computer teachers' perceptions (i.e. environmental and professional factors); however, there may be other aspects affecting the perceptions of teachers and teacher candidates. Therefore, more research is required on this issue as well as on factors influencing the training and teaching processes of both inservice and preservice teachers.
2) Researcher developed a new instrument including two sub-factors to measure computer teachers' perception of teaching. Since there is a high correlation between two factors, it was used as one-dimension instrument. Therefore, further studies should be conducted to increase the reliability of this instrument.
3) According to computer teachers' opinions, computer teaching is unnecessary. They argue that one should not necessarily become a teacher in order to introduce only a part of a machine, computer. This finding is another issue that requires further research.
4) It is obvious that the interests of the computer teachers in the profession have decreased over the years. In this respect, further studies should be conducted in order to find out what are the reasons behind this decrease of interest.

5) Although all CEIT departments have the same curricula, this study indicates there are differences in terms of competencies among the preservice teachers from different universities. The reasons behind this should be investigated in further studies.
6) On the other hand, the results of this study demonstrate there is a gap between the training in university and the real life practices. The reasons of the gap should be examined in detail by conducting field research. To that end, large-scale studies should be conducted with all stakeholders which are instructors, HEC, MoNE, and primary school teachers. In addition, computer teachers, who are the key players in this process, should be included in these studies.
7) Parallel to this current study, similar studies can be conducted in different departments about the use of computers in their classroom practices to compare with this study.
8) All in all, if we want to improve the quality of computer teaching in school classrooms, more rational and strategic studies and projects are needed. Therefore, teacher trainers should understand the needs of the preservice and inservice teachers as well as their professional growth. In this respect, teacher professional growth consortium may be established by the teacher education authorities.

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APPENDICES

QUESTIONNAIRES

Sayın Bilgisayar Öğretmeni Adayı,

Bu anket bilgisayar öğretmeni adaylarının mesleki gelişimlerini ve bilgisayar öğretmenliğine bakış açılarını belirlemek amacıyla geliştirilmiştir. Anket 5 kısımdan oluşmaktadır. Birinci bölümde kişisel bilgileriniz, 2. bölümde bilgisayar öğretmenliği hakkındaki görüşleriniz, 3. bölümde derslere teknoloji entegrasyonunu (uyarlama) etkileyen faktörler ve son iki bölümde ise öğretmen olduğunuzda sahip olmanız gereken konu alanı ve pedagoji alanındaki özellikleriniz ile ilgili maddeler bulunmaktadir. Anketin doldurulması yaklaşık 15 dakika sürmektedir. Anketten elde edilecek bilgiler araştırma amaçlı kullanılacaktır. Ankette yer alan maddeleri size en uygun şekliyle ve eksiksiz olarak işaretleyeceginize inaniyoruz.

Katkılarınızdan dolayı teşekkür ederiz. Saygılarımızla,

Doç. Dr. Soner YILDIRIM
Arş. Gör. Recep ÇAKIR
ODTÜ

A. DEMOGRAPHICS FOR PARTICIPANTS

1. Demographics for Preservice Teachers

DEMOGRAFIK BILGILER
Aşağıda kişisel bilgiler ile ilgili sorular yer almaktadır. Lütfen kendi durumunuzla ilgili bilgilerinizi ilgili kutucuğa işaretleyiniz.

Cinsiyetiniz: Bay Bayan

Sınıfınız: 2.sınıf 3.sınıf 4.sınıf

Yaşınız:

Not ortalamanız:

Üniversite giriş puanınız:

Bölüm tercih sıranız:

Mezun Olduğunuz Lise: Genel lise Anadolu lisesi Meslek/Teknik lisesi Anadolu Meslek/Teknik

Annenizin Eğitim Durumu:
İlköğretim Lise Y.okul Üniversite Lisansüstü Hiçbiri

Babanızın Eğitim Durumu:
İlköğretim Lise Y.okul Üniversite Lisansüstü Hiçbiri

Annenizin Mesleği:
Serbest Meslek İşçi Öğretmen Memur Çiftçi Emekli Diğer Ev hanımı

Babanızın Mesleği:
Serbest Meslek İşçi Öğretmen Memur Çiftçi Emekli Diğer

2. Demographics for Inservice Teachers

DEMOGRAFIK BILGILER
Aşağıda kişisel bilgiler ile ilgili sorular yer almaktadır. Lütfen kendi durumunuzla ilgili bilgilerinizi ilgili kutucuğa işaretleyiniz.

Cinsiyetiniz: ○ Bay ○ Bayan

Hizmet yılınız: ○ 1 yıl ○ 2 yıl ○ 3 yıl ○ 4 yıl ○ other

Görev yaptığınız okul:

Yaşınız:

Mezun Olduğunuz Üniversite:

Lisansüstü Eğitim : ○ Yüksek lisans ○ Doktora

Annenizin Eğitim Durumu:
○ İlköğretim ○ Lise ○ Y.okul ○ Üniversite ○ Lisansüstü ○ Hiçbiri

Babanızın Eğitim Durumu:
○ İlköğretim ○ Lise ○ Y.okul ○ Üniversite ○ Lisansüstü ○ Hiçbiri

Annenizin Mesleği:
○ Serbest Meslek ○ İşçi ○ Öğretmen ○ Memur ○ Çiftçi ○ Emekli
◉ Diğer ○ Ev hanımı

Babanızın Mesleği:
○ Serbest Meslek ○ İşçi ○ Öğretmen ○ Memur ○ Çiftçi ○ Emekli ○ Diğer

B. QUESTIONNAIRE OF THE PERCEPTION OF COMPUTER TEACHING

BILGISAYAR ÖĞRETMENLİĞİ HAKKINDA ALGI
Aşağıdaki listede bilgisayar öğretmenliği hakkında görüşler bulunmaktadır. Lütfen her bir madde için kendi görüşünüzü işaretleyin

1	2	3	4	5
Hiç katılmıyorum				**Tamamen katılıyorum**

1)Yeniden üniversite sınavına girsem bilgisayar öğretmenliğini yine seçerim	1	2	3	4	5
2)Bilgisayar öğretimini eğlenceli bulurum	1	2	3	4	5
3)Bilgisayar öğretmenliği alanında özel bir yeteneğim olduğunu düşünüyorum	1	2	3	4	5
4)Bilgisayar öğretmenliği yapmak beni heyecanlandırıyor.	1	2	3	4	5
5)Bilgisayar öğretmenliği benim karakterime uygun bir meslek değildir	1	2	3	4	5
6)Bilgisayar laboratuvarlarında ders anlatmak bana sıkıcı gelir	1	2	3	4	5
7)Bilgisayar öğretmenliğinin toplumda diğer öğretmenlere göre daha fazla saygı duyulan bir meslek olduğuna inanıyorum	1	2	3	4	5
8)Bilgisayar öğretmenini toplumun teknolojik bilgilerini geliştirmesine katkı sağlayan birisi olarak görüyorum	1	2	3	4	5
9)Diğer öğretmenlerin okulda bilgisayar öğretmenini kendilerine örnek aldıkları kanısındayım	1	2	3	4	5
10) Bilgisayar öğretmeninin öğrencilerin sosyal açıdan yaşamlarını farklılaştırdığına inanıyorum	1	2	3	4	5
11)Meslek olarak bilgisayar öğretmenliği bana hiç cazip gelmiyor	1	2	3	4	5
12)Öğrencilerin bilgisayar öğretmenini okuldaki diğer öğretmenlerden daha fazla sevdikleri kanısındayım	1	2	3	4	5
13)Bilgisayar öğretmenlerinin öğrencilerin kültür seviyesini yükselttiğini düşünüyorum	1	2	3	4	5
14)Aranan ve seçkin bir meslek olma açısından bilgisayar öğretmenliğini diğer branşlara göre daha üstün olarak görüyorum	1	2	3	4	5
15) Bilgisayar öğretmenlerinin öğrencileri araştırmaya yönelterek daha başarılı bir öğrenci olmalarını sağladığını düşünüyorum	1	2	3	4	5
16)Bilgisayar öğretmenliğinin diğer branşlarla karşılaştırıldığında zor bir alan olduğuna inanıyorum	1	2	3	4	5

C. QUESTIONNAIRE OF THE FACTORS AFFECTING TECHNOLOGY INTEGRATION INTO SCHOOLS

OKULDA TEKNOLOJİ ENTEGRASYONUNU ETKİLEYEN FAKTÖRLER
Aşağıdaki listede teknoloji entegrasyonunu etkileyen faktörler ile ilgili maddeler yer almaktadır. Lütfen, tabloda da gösterildiği şekliyle her bir madde için kendi görüşlerinizi belirtiniz.

1	2	3	4	5

Etkili olma durumu
Az etkili ⟵ ⟶ **Çok etkili**

1) Öğretmenin teknoloji bilgisi	1	2	3	4	5
2) Öğretmenin teknolojiye karşı tutumu	1	2	3	4	5
3) Teknik problemlerin çözülmesi	1	2	3	4	5
4) Öğretilecek konu-içerik	1	2	3	4	5
5) Kullanılan teknolojinin dersin hedeflerine göre seçilmesi	1	2	3	4	5
6) Kullanım sırasında teknik desteğin sağlanması	1	2	3	4	5
7) Okul idarecilerinin teknolojiye karşı tutumu	1	2	3	4	5
8) Öğrenme hedeflerinin belirlenmesi	1	2	3	4	5
9) Öğretmenin hangi konuda hangi teknolojik araç gereci kullanılacağına dair yeterli bilgiye sahip olması.	1	2	3	4	5
10) Kullanılan öğretim metodlarının öğrenci merkezli hale getirilmesi	1	2	3	4	5
11) Teknoloji uyarlanmış bir dersin sunumunda bir yardımcının olması	1	2	3	4	5
12) Teknolojik araç-gereçlerin kullanılmasına ilişkin öğretmenin aldığı hizmet öncesi dersler	1	2	3	4	5
13) Teknolojik araç gereçlerin kullanılmasına ilişkin öğretmenlere verilen hizmet içi eğitim	1	2	3	4	5
14) Öğretmenin teknoloji entegrasyonuna uygun ders planı hazırlaması	1	2	3	4	5
15) Sınıftaki öğrenci sayısı	1	2	3	4	5
16) Bilgisayar laboratuvarlarına ve diğer teknolojik araç gereçlere erişim	1	2	3	4	5
17) Teknoloji tabanlı dersi uygularken yeterli zamanın sağlanması	1	2	3	4	5
18) Öğretmenin teknolojiyi kullanma becerisi	1	2	3	4	5
19) Derste kullanılacak teknolojinin çeşitliliği	1	2	3	4	5
20) Öğrencinin teknolojiye karşı tutumu	1	2	3	4	5
21) Öğrencinin teknoloji kullanma becerisi	1	2	3	4	5
22) Öğrencilerin seviyeleri (1.sınıf, 2. sınıf, 3.sınıf vs.)	1	2	3	4	5
23) Okuldaki bilgisayar laboratuvarı ve bilgisayar sayısı	1	2	3	4	5
24) Sınıflarda teknolojik araç gereçlerin (Bilgisayar, tepegöz vs.) bulunması	1	2	3	4	5
25) Okullarda kullanılan yazılımların çeşitliliği	1	2	3	4	5
26) Velilerin teknoloji kullanımını desteklemesi	1	2	3	4	5
27) Teknolojik araç gereçlerin yeni ve kullanılabilir olması	1	2	3	4	5

☐ Diger

Yukarıda verdiğiniz yanıtlar dışında "Teknoloji Entegrasyonunu Engelleyen Faktörler" ile ilgili eklemek istediğiniz başka noktalar varsa lütfen yazınız.

D. QUESTIONNAIRE OF THE PEDAGOGICAL COMPETENCIES

PEDAGOJİK YETERLİLİKLER
Aşağıdaki listede pedagojik yeterliliklerle ilgili maddeler bulunmaktadır. Lütfen, tabloda gösterildiği şekliyle her bir madde için kendi yeterlilik durumunuzu belirtiniz

1	2	3	4	5
Hiç Yeterli Değilim ←				→ **Tamamen Yeterliyim**

1) Ders plânında hedef ve davranışları açık biçimde ifade etme.	1	2	3	4	5
2) Ders plânındaki hedef ve davranışları gerçekleştirmeye yönelik öğrencileri güdüleyici öğrenme-öğretme etkinliklerini düzenleme	1	2	3	4	5
3) Plânlamada öğrenciler arasındaki bireysel farklılıkları ve öğrenme stillerini göz önünde bulundurma	1	2	3	4	5
4)Ders plânında bilgi ve iletişim teknolojilerinin nasıl kullanılacağına yer verme	1	2	3	4	5
5) Oturma düzenini öğrenci özelliklerine ve onların öğrenmelerini kolaylaştırabilecek biçimde düzenleme	1	2	3	4	5
6) Öğrencilerin farklı etkinlikler önermesine ve bunlara katılmasına olanak sağlama	1	2	3	4	5
7) Ders plânında yer alan konuyu, bütünlük sağlaması için önceki ve sonraki konularla ilişkilendirme	1	2	3	4	5
8)Öğrencilerin yaşlarına, önceki öğrenme düzeylerine ve yeteneklerine uygun yöntem ve tekniklerden yararlanma ve bunları kullanma	1	2	3	4	5
9) Zamanı plânlı ve verimli biçimde kullanma	1	2	3	4	5
10) Öğrencilerin öğrendiklerini yaşamlarıyla ilişkilendirecek fırsatlar yaratma	1	2	3	4	5
11) Öğrencilerin katılımını sağlayacak etkinlikler (bireysel, ikili, grup çalışması, gösteri, gezi, gözlem, deney, panel vb) uygulama	1	2	3	4	5
12) Öğrencilerin düzeylerine uygun, konuya ilgilerini çekecek ve düşünmelerini sağlayacak biçimde farklı sorular sorma	1	2	3	4	5
13) Öğrencilerin kendilerini gerçekleştirmeleri için onlara sınıf içi ve dışında çeşitli etkinlikler ve olanaklar sunma	1	2	3	4	5
14) İşlenen dersi örneklendirerek, günlük yaşamla ilişkilendirebilme	1	2	3	4	5
15) Öğrencilerin derse karşı ilgisini çekme, onları güdüleme ve bunların sürekliliğini sağlama	1	2	3	4	5
16) Öğrencileri değerlendirmek için amaca uygun ölçme aracı belirleme ve bunu kullanma	1	2	3	4	5
17) Ölçme aracının geçerlilik ve güvenirliliğini tespit etme	1	2	3	4	5
18) Bilgi ve iletişim teknolojilerini kullanarak verileri analiz etme	1	2	3	4	5
19) Ölçme sonuçlarını yorumlama ve öğrenciye geri bildirim verme	1	2	3	4	5
20) Teknoloji destekli öğrenme ortamlarında davranış yönetimi için stratejiler geliştirme ve uygulama	1	2	3	4	5
21) Öğrencilerin düzeyine uygun sözel dili ve beden dilini etkili biçimde kullanma (duruş, mimikler, el, kol hareketleri, vb)	1	2	3	4	5
22) Öğrencileri dinleme, öğrencilerden gelen soru ve yanıtlara duyarlı olma.	1	2	3	4	5

E. QUESTIONNAIRE OF THE SUBJECT MATTER COMPETENCIES

KONU ALANI YETERLİLİKLER
Aşağıdaki listede konu alanı yeterlilikleri ilgili maddeler bulunmaktadır. Lütfen, tabloda da gösterildiği şekliyle her bir madde için kendi yeterlilik durumunuzu belirtiniz

1	2	3	4	5
Hiç Yeterli Değilim ←				→ **Tamamen Yeterliyim**

1. Bilgisayarda arızalanan ve/veya yenilenmesi gereken parçaları değiştirme	1	2	3	4	5
2. Bilgisayara gerekli yazılımları kurma, sistemle ilgili ayarlamaları yapma ve gerektiğinde yazılımları güncelleme ve bilgisayardan kaldırma	1	2	3	4	5
3. Derslerde ve okulda ortaya çıkan-çıkabilecek yazılım ve donanım problemlerini çözecek stratejiler geliştirme	1	2	3	4	5
4. Sık kullanılan süreçleri otomatikleştirerek amaca uygun etkin yöntemler geliştirme. (hesap programlarında şablon, makrolar, kontrol yöntemleri, formüller ve hesaplamalar oluşturma)	1	2	3	4	5
5. Uygun ağ kurma ve bunu kullanarak kurum içindeki bilgisayarların birbirleri ile haberleşmesini sağlama	1	2	3	4	5
6. İnternet uygulamalarını etkili bir şekilde kullanma. (telnet, internet tarayıcıları, dosya transfer protokolu, posta grupları, haber grupları, internet portalları ve araştırma motorları vs)	1	2	3	4	5
7. Yardımcı donanım birimlerini tanıtma, işlevlerini uygulamalı gösterme.(Tarayıcı, yazıcı, dijital fotoğraf makinesi vs.)	1	2	3	4	5
8. Program öğrenme içeriği ile tutarlı, öğrenenlerin zekâ (çoklu zekâ) ve öğrenme stillerine uygun eğitsel yazılımlar tasarlama ve geliştirme	1	2	3	4	5
9. Bilgi sistemleri tasarlama, var olan sistemleri değerlendirme ve geliştirici önerilerde bulunma. (Bir web sitesi, LMS, veri tabanı hazırlama ve değerlendirme gibi)	1	2	3	4	5
10. Öğrenenlerin çoklu ortamlar (metin, tablo, görüntü ve ses) tasarlamalarına yardımcı olacak stratejiler geliştirme	1	2	3	4	5
11. Özel gereksinimli (fiziksel, zihinsel engelli) öğrenenlerin ihtiyaçlarına yönelik uygun teknolojilerin kullanımını içeren öğrenme etkinlikleri tasarlama	1	2	3	4	5
12. Öğrenme-öğretme amaçlı geliştirilmiş değişik araç ve içerik temelli yazılımları değerlendirme, seçme ve kullanma	1	2	3	4	5
13. İletişim, problem çözme, düşünce ve fikirlerin sunumunda teknolojik araçlardan yararlanma. (tartışma grupları, chat, forum, yazı araçları, hesap tabloları çizim programları)	1	2	3	4	5
14. Kelime işlemciler, veritabanları, tablolama/hesaplama programları, hipermedia, web hazırlama, hareketli resim, grafik, masa üstü yayıncılık gibi uygulama programlarını kullanarak öğrenme materyalleri geliştirme	1	2	3	4	5
15. Öğrenenlerin yaratıcılıklarını gelişmesine yardımcı olacak bilgi ve iletişim teknolojilerini kullanmalarını sağlama. (Bir görüntü üzerinde farklı renkleri deneme, bir serüven oyunu veya simülasyonu kullanma	1	2	3	4	5
16. Öğrenci kayıtları için öğrenme yönetim sistemleri veya elektronik not verme programlarını kullanma	1	2	3	4	5

17. Öğrenenlerin farklı ortamları kullanarak bilgi paylaşmalarını sağlama (e-posta, sergi, poster, animasyon, ağ)	1	2	3	4	5
18. Öğrenenlerin, orijinal ürünler üretmesi, analiz, sentez ve yorumlama becerilerinin gelişmesine yardımcı olacak teknoloji temelli öğretme etkinlikleri planlama ve uygulama	1	2	3	4	5
19. Araştırma, bilgiye erişim ve bilgiyi paylaşma amacı ile mesleki portallar ve ERIC gibi veri tabanlarını kullanma	1	2	3	4	5
20. Bilgi ve teknolojiyi kullanırken veri ve bilginin güvenliği, telif hakları ve gizlilik gibi teknoloji ile ilgili yasaları ve etik (ahlaki) kuralları bilme ve bunlara uygulama.	1	2	3	4	5
21. Mesleki gelişimini artırabilmek için diğer öğrenmelerle teknolojiyi kullanarak işbirliği yapma	1	2	3	4	5
22. Okulda ve toplumda teknolojiye eşit erişim ile ilgili süreçleri bilme ve uygulanmasında öncü olma	1	2	3	4	5
23. Öğrenenlerin teknoloji kullanımda olumlu sosyal ve ahlaki davranışlar göstermesini sağlama	1	2	3	4	5
24. Öğretme-öğrenme sürecinde teknolojinin uygun ve uygun olmayan kullanımları arasındaki farkı bilme ve bu konuda meslektaşları ve öğrencilere örnek olma	1	2	3	4	5
25. Eğitim teknolojileri ve uygulamalarında güncel kalabilmek için internet, mesleki organizasyonlar, konferanslar, dergi ve gazete gibi kaynakları takip etme	1	2	3	4	5
26. Mesleki gelişim ve yaşam boyu öğrenme için gerekli olan uzaktan eğitim gibi teknoloji tabanlı fırsatları belirler ve bunlardan yararlanma	1	2	3	4	5

F. INTERVIEW SCHEDULE

Görüşmeyi yapan:
Görüşülen: .... **(Bilgisayar ve Öğretim Teknolojileri öğretmeni / adayı)**
Görüşme Tarihi:................ Görüşme Süresi: ....

Giriş
Merhaba, ben Bilgisayar ve Öğretim Teknolojileri Eğitimi bölümünde doktora yapıyorum. Öğretmenlik deneyiminiz ile ilgili bir araştırma yapmaktayım. Sizin bilgisayar öğretmenliği hakkındaki düşünceleriniz ile bu uygulamalar ve üniversite eğitiminiz sırasında bölümünüzde gördüğünüz dersler hakkındaki görüşlerinizi almak istiyorum. Bu görüşmede amacım, bilgisayar öğretmenleri ve adaylarının, lisans eğitimleri sırasında gördükleri eğitimlerin uygulamalara nasıl yansıttıklarını öğrenmektir. Bu araştırmada ortaya çıkacak sonuçların eğitim-öğretim programlarına katkısı olacağı açıktır. Bu yüzden sizin düşüncelerinizi ve görüşlerinizi açıkça ifade etmenizi istiyorum.

-Görüşmemizde konuşulanların gizli olduğunu ve araştırma sonuçlarını yazarken kimliğiniz ile ilgili bilgilerin kesinlikle yansıtılmayacağını belirtmek isterim.
- Bu görüşmenin yaklaşık 30-40 dakika süreceğini tahmin ediyorum. Katıldığınız için şimdiden teşekkür ederim.

Başlangıç Soruları
1. Hangi liseden/üniversiteden mezun oldunuz?
2. Ailenizde öğretmen biri var mı?
3. Teknoloji ile aranız nasıl görüyorsunuz, örneğin teknolojik gelişmeleri yakından takip edebiliyor musunuz?
4. Öğretmenlik / deneyimi yaptığınız okulunuzun özellikleri nelerdir? Okulun adı, (isteğe bağlı) laboratuvar sayısı, bilgisayar öğretmeni sayısı vb.
5. Okuldaki diğer branş öğretmenlerinin özelliklerini nasıl görüyorsunuz örneğin teknoloji konusunda yeterliliğini nasıl değerlendirirsiniz, teknoloji ile aralan nasıl, sizin bu öğretmenlerle ilişkileriniz nasıl?

Görüşme soruları

1. ***Bilgisayar Öğretmenliğini meslek olarak nasıl değerlendiriyorsunuz? (Bilgisayar Öğretmenliği hakkındaki görüşleriniz nelerdir?)***

Açıklama: Üniversiteye başlarken ki düşüncelerinizle şimdiki düşüncelerinizi karşılaştırır mısınız?

2. ***Size göre bilgisayar öğretmenliği nasıl olmalı, bilgisayar öğretmenliğinden beklentileriniz nelerdir?***

Okuldaki görevleri açısından,
Toplumdaki görevleri açısından

3. ***Size göre öğretme-öğrenme etkinliklerinde teknoloji kullanımının önemi nedir, örnekler vererek açıklayabilir misiniz?***

Öğretmen açısından, Öğrenci açısından

4. ***Öğretim süresinde, teknoloji entegrasyonu sizce ne anlama gelmektedir?***

Alternatif: Öğretim sürecinde, teknoloji entegrasyonu sizce nasıl yapılmalıdır?

5. ***Öğretim uygulaması esnasında bir ders planı hazırlarken dikkat ettiğiniz hususlar nelerdir?***

6. ***Öğretim uygulaması esnasında ders işlenişi esnasında dikkat ettiğiniz hususlar nelerdir?***

7. ***Öğretim uygulaması esnasında ders işlenişi esnasında öğrencilerle nasıl iletişim kuruyorsunuz?***

8. ***Öğretim uygulaması esnasında ders bittikten sonra değerlendirmelerinizi nasıl yapıyorsunuz?***

9. ***Öğretim uygulaması esnasında öğretim metodlarını belirlerken teknolojiden ne şekilde yararlanıyorsunuz?***

Alternatif: Anlatacağınız ders için yöntem belirledikten sonra, bu yönteme hangi teknolojilerin nasıl entegre edileceğine nasıl karar veriyorsunuz, nedenleriyle açıklar mısınız?

10. ***Dersi teknoloji kullanarak işlemenin öğrenciye etkileri konusundaki görüşleriniz nelerdir?***

11. ***Size göre derste teknoloji kullanımını engelleyen başlıca faktörler nelerdir, bu engellerin üstesinden gelebilmek için önerileriniz nelerdir?***

12. ***Bölümünüzde aldığınız pedagoji ve konu alanı derslerinin, sizin öğretim sürecinizde teknoloji kullanımına olan etkileri nelerdir?***

Sonda: Eğitimde Bilişim teknolojileri (Information Technology in Education), Bilgisayar Destekli Öğretim, Uzaktan Eğitim (Foundations Of Distance Education), Eğitimde İnternet Uygulamaları (Applications In Education), Öğretim Teknolojileri ve Materyal Geliştirme, (Instructional Technology and Material Development)
Okul deneyimleri (School Experience), Bilgisayar Eğitiminde Öğretim Metodları (Teaching Methods in Computer Education), Sınıf Yönetimi (Classroom Management), Öğretim Yazılımı Tasarımı, Geliştirilmesi ve Değerlendirilmesi (Design, Development & Evaluation of Educational Software)
Alternatif: Öğretmenlik uygulamaları sırasındaki deneyimlerinizi ve lisans eğitiminde aldığınız dersleri göz önünde bulundurduğunuzda kendinizi eksik ya da yeterli hisstettiğiniz noktalar nelerdir?
Prompt: Pedagoji dersler açısından
Alan dersleri açısından

13. ***Uygulama okulundaki uygulamalara ve diğer öğretmenlerin yaptıklarına baktığınızda öğretmenlerin teknoloji entegrasyonu konusundaki gözlemlerinizden yola çıkarak düşüncelerinizi belirtirmisiniz?***

Son olarak eklemek istediğiniz başka bir nokta var mı?
Görüşmemiz bitmiştir, görüşlerinizi benimle paylaştığınız için teşekkür ederim.

G. OBSERVATION PROCEDURE

Observer's name: Recep ÇAKIR
Class: ……..
Name of the course: …………..
Name of the unit: ………..
Topic: …………..
Observation Date: …..
Duration of Observation: ……
Class size: …

Purpose
The purpose of this observation is to determine how prospective computer teachers use their pedagogical and technological knowledge (subject matter) skills in their teaching while they teach subject during the teaching practice. Because teaching practices are the first experience for teacher candidates before they work in-service, it is important to understand for their future career what is going on in actual practice time. Therefore, the following questions provide a guideline for observation:

1. How does the teacher begin the lesson?
2. What kind of activities does the teacher start the lesson with?
3. What kind of teaching strategies or methods does the teacher use while teaching?
4. What kind of instructional materials and tools does the teacher use while teaching?
5. How does the teacher utilize these materials in the teaching process?
6. How does the teacher use time in the teaching process?
7. How does the teacher communicate and interact with their students while teaching?
8. How does the teacher give feedback to students during the teaching process?
9. How does the teacher use verbal and body language (posture, mimics, hand and arm movements etc.) during the teaching process?
10. How does the teacher evaluate and asses their students after teaching?

Data Collection

A typical teaching practice class session are observed by the researcher while a prospective computer teacher performs the lesson to explore their transfer of knowledge into teaching practice. Note taking and a video camera recording are used to record classroom activities and teacher behavior during the session. The following aspects are considered by the researcher during the observation;

1) Context: Physical description of the classroom, teaching and learning environment, logistics of the classroom, (desk, tables, arrangement of computers and other equipments).

2) Pre-instructional process: Planning of the lesson, stating the goals, objectives and behaviors of the lesson plan, acknowledgement of the students etc.

3) Instructional process: Preparing and conducting activities, giving examples, using teaching methods or strategies, using instructional materials and tools, providing practice, interaction with students,

4) Classroom management: Asking questions to students, listening to students and responding to their questions, motivating students, using verbal or body language, using time

5) Post instructional process: Assessing and evaluating the students and giving feedback to them, checking for understanding.

Coding System

The following coding categories are used in interpreting the field notes to classify data.
If necessary, some extra categories are added or some included below may be changed.

Classroom environment
Arrangement of seating
Arrangement of computers, desks or other equipment
Classroom activities
Directing
Presenting
Questioning
Assisting
Answering
Interacting
Providing practice
Communicating
Managing and disciplining
Managing
Praising
Assessing
Using teaching strategies
Using instructional materials, tools
Choosing an approach
Determining motivation
Praising and criticizing

H. LIST OF CEIT DEPARTMENTS

1.	Abant Izzet 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)
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 -(KKTC-GAZİMAĞUSA)
15.	Dokuz Eylül Üniversitesi, Buca Eğitim Fakültesi, BÖTE Bölümü – (İZMİR)
16.	Ege Üniversitesi, Eğitim Fakültesi, BÖTE Bölümü – (İZMİR)
17.	Erzincan Universitesi, Eğitim Fakültesi, BÖTE Bölümü- (ERZINCAN)*
18.	Eskişehir Osmangazi Üniversitesi, , Eğitim Fakültesi, BÖTE Bölümü- (ESKISEHIR)
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.	Istanbul Aydin Üniversitesi, Fen-Edebiyat Fakültesi, BÖTE Bölümü - (ISTANBUL)*
26.	İstanbul Üniversitesi, Hasan Ali Yücel Eğitim Fakültesi, BÖTE Bölümü – (İSTANBUL) *
27.	Kahramanmaraş Sütçü Imam Üniversitesi, Eğitim Fakültesi, BÖTE Bölümü-(K. MARAS)*
28.	Karadeniz Teknik Üniversitesi, Fatih Eğitim Fakültesi, BÖTE Bölümü – (TRABZON)
29.	Kirikkale Üniversitesi, Eğitim Fakültesi, BÖTE Bölümü- (KIRIKKALE) *
30.	Marmara Üniversitesi, Atatürk Eğitim Fakültesi, BÖTE Bölümü – (İSTANBUL)
31.	Mehmet Akif Ersoy Üniversitesi, Eğitim Fakültesi, BÖTE Bölümü - (BURDUR)
32.	Ondokuz Mayıs Üniversitesi, Eğitim Fakültesi, BÖTE Bölümü – (SAMSUN)
33.	ODTÜ, 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- (SIIRT) *
37.	Trakya Üniversitesi, Eğitim Fakültesi, BÖTE Bölümü (EDİRNE) *
38.	Uludağ Üniversitesi, Eğitim Fakültesi, BÖTE Bölümü – (BURSA)
39.	Yakin Doğu Üniversitesi- Atatürk Eğitim Fakültesi, BÖTE Bölümü - (KKTC-LEFKOŞE)
40.	Yeditepe Üniversitesi, Eğitim Fakültesi, BÖTE Bölümü - (İSTANBUL)*
41.	Yıldız Teknik Üniversitesi, Eğitim Fakültesi, BÖTE Bölümü- (İSTANBUL)
42.	Yüzüncü Yil Üniversitesi, Eğitim Fakültesi, BÖTE Bölümü - (VAN)

* Yeni açılan bölümler, 2008 ÖSYS kılavuzu

I. A SAMPLE PERMISSION FORM FROM THE UNIVERSITIES FOR THE QUESTIONNAIRES

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Orta Doğu Teknik Üniversitesi
Middle East Technical University

Öğrenci İşleri Dairesi
Başkanlığı
Registrar's Office

06531 Ankara, Türkiye
Phone: +90 (312) 2103417
Fax: +90 (312) 2101117
www.oidb.metu.edu.tr

B.30.2.ODT.0.70.72.00/400 3454 006335 21.4.2006

BAŞKENT ÜNİVERSİTESİ REKTÖRLÜĞÜ

Üniversitemiz Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü Araştırma Görevlilerinden Recep ÇAKIR "Bilgisayar Öğretmeni Adaylarının Öğretmenlik Mesleği Hakkında Görüşleri ve Yeterlilikleri Açısından Mesleki Gelişimlerinin İncelenmesi" konulu tez çalışmasına veri sağlamak amacıyla Üniversiteniz Bilgisayar ve Öğretim Teknolojileri Bölümü öğrencilerine anket uygulamak istemektedir.

Görüşmelerin yapılabilmesi için gereğini izninize sunarım.

Saygılarımla.

Prof. Dr. Mehmet UTKU
Rektör Yardımcısı

Nesrin ÜNSAL/Öğrenci İşleri Dai.Bşk.

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J. K8 SCHOOLS IN ANKARA WHICH WERE ADMINISTERED SURVEYS

İLÇE	OKUL	BRANŞ	Öğretmen Sayısı
ÇANKAYA	Beytepe İlköğretim Okulu	Bilgisayar	1
ÇANKAYA	Dr.Reşit Galip İlköğretim Okulu	Bilgisayar	1
ÇANKAYA	Gülen Muharrem Pakoğlu İlköğretim Okulu	Bilgisayar	1
ÇANKAYA	Hamdullah Suphi İlköğretim Okulu	Bilgisayar	1
ÇANKAYA	Kavaklıdere İlköğretim Okulu	Bilgisayar	1
ÇANKAYA	Tevfik İleri İlköğretim Okulu	Bilgisayar	1
ETİMESGUT	Eryaman Bahar İlköğretim Okulu	Bilgisayar	1
ETİMESGUT	Eryaman Şehit Rıfat Çelik İ.Ö.O	Bilgisayar	1
ETİMESGUT	Etimesgut İlköğretim Okulu	Bilgisayar	1
ETİMESGUT	İstiklal İlköğretim Okulu	Bilgisayar	1
ETİMESGUT	Zekiye Güdüllüoğlu İlköğretim Okulu	Bilgisayar	1
SİNCAN	Ahmet Andiçen İlköğretim Okulu	Bilgisayar	1
SİNCAN	Atıf Benderlioğlu İlköğretim Okulu	Bilgisayar	1
SİNCAN	Gaziosmanpaşa İlköğretim Okulu	Bilgisayar	1
SİNCAN	Maraşal Fevzi Çakmak İlköğretim Okulu	Bilgisayar	1
SİNCAN	Osman Ünyazıcı İlköğretim Okulu	Bilgisayar	1
SİNCAN	103 Yıl İlköğretim Okulu	Bilgisayar	2
ALTINDAĞ	Atilla İlköğretim Okulu	Bilgisayar	1
ALTINDAĞ	Ayşe Numan Konakçı İlköğretim Okulu	Bilgisayar	1
KEÇİÖREN	Cagrı Bey İlköğretim Okulu	Bilgisayar	1
KEÇİÖREN	Hüseyin Güllüoğlu İlköğretim Okulu	Bilgisayar	2
KEÇİÖREN	Kocatepe İlköğretim Okulu	Bilgisayar	1
KEÇİÖREN	Necip Fazıl İlköğretim Okulu	Bilgisayar	1
KEÇİÖREN	Tarhuncu Ahmet Paşa İlköğretim Okulu	Bilgisayar	1
MAMAK	Kuva-yi Milliye İlköğretim Okulu	Bilgisayar	1
MAMAK	30 Ekim İlköğretim Okulu	Bilgisayar	1
YENİMAHALLE	Abay İlköğretim Okulu	Bilgisayar	1
YENİMAHALLE	Dede Korkut İlköğretim Okulu	Bilgisayar	1
YENİMAHALLE	Prof.Dr.Mehmet Sağlam İlköğretim Okulu	Bilgisayar	1
YENİMAHALLE	Sofuoğlu İlköğretim Okulu	Bilgisayar	1
YENİMAHALLE	Yunus Emre İlköğretim Okulu	Bilgisayar	1
YENİMAHALLE	İsmail Erez İlköğretim Okulu	Bilgisayar	1
AKYURT	Akyurt İlköğretim Okulu	Bilgisayar	1
AKYURT	Barmek İlköğretim Okulu	Bilgisayar	1
BALA	Tınaztepe İlköğretim Okulu	Bilgisayar	1
BALA	Karaali Yatılı İlköğretim Bölge Okulu	Bilgisayar	1
BEYPAZARI	Beypazarı Endüstri Meslek Lisesi	Bilgisayar	2

BEYPAZARI	Cumhuriyet İlköğretim Okulu	Bilgisayar	1
ÇAMLIDERE	Merkez Atatürk İlköğretim Okulu	Bilgisayar	1
ÇUBUK	Atatürk İlköğretim Okulu	Bilgisayar	1
ÇUBUK	Cumhuriyet İlköğretim Okulu	Bilgisayar	1
ÇUBUK	Çubuk İlköğretim Okulu	Bilgisayar	1
ÇUBUK	Hayri Aslan Kız Teknik ve Meslek Lisesi	Bilgisayar	2
GÜDÜL	Güdül Çok Programlı Lisesi	Bilgisayar	1
GÜDÜL	Güdül İlköğretim Okulu	Bilgisayar	1
HAYMANA	Oyaca Çok Programlı Lisesi	Bilgisayar	2
HAYMANA	İstiklal İlköğretim Okulu	Bilgisayar	1
HAYMANA	Mahmut Hilmi Doğan İlköğretim Okulu	Bilgisayar	1
HAYMANA	Yenice İlköğretim Okulu	Bilgisayar	1
HAYMANA	12 Eylül İlköğretim Okulu	Bilgisayar	1
KAZAN	Atatürk İlköğretim Okulu	Bilgisayar	1
KAZAN	Tahsin Şahinkaya İlköğretim Okulu	Bilgisayar	1
KIZILCAHAMAM	Kazım Karabekir İlköğretim Okulu	Bilgisayar	1
NALLIHAN	Nallıhan Şehit Vural Arıcı Anadolu Lisesi	Bilgisayar	1
NALLIHAN	Çayırhan Gazi Mete Okuducu İlköğretim Ok	Bilgisayar	1
NALLIHAN	Sakarya İlköğretim Okulu	Bilgisayar	1
POLATLI	Atatürk İlköğretim Okulu	Bilgisayar	1
POLATLI	Bedriye Halil Naci Mıhcıoğlu İlköğr. Okulu	Bilgisayar	1
POLATLI	Beylikköprü Şh.Yzb.Nazmi Elmas İlköğretim Okulu	Bilgisayar	1

K. PERMISSION FORM FROM THE MONE FOR THE QUESTIONNAIRES

T.C.
MİLLÎ EĞİTİM BAK ANLIĞI
Eğitimi Araştırma ve Geliştirme Dairesi Başkanlığı

Sayı : B.08.0.EGD.0.33.05.311-505/ 1658 — 21./04/2006
Konu : Araştırma İzni

ANKARA VALİLİĞİNE
(İl Millî Eğitim Müdürlüğü)

İlgi : 06.04.2006 tarih ve B.08.4.MEM.4.06.00.11.0-9-985/3310 sayılı yazınız.

Orta Doğu Teknik Üniversitesi Bilgisayar ve Öğretim Teknolojileri Eğitimi Ana Bilim Dalı doktora öğrencisi Recep ÇAKIR'ın "Bilgisayar Öğretmenlerinin Öğretmenlik Mesleği Gelişimlerinin İncelenmesi" konulu araştırmada kullanılacak veri toplama araçlarının, İliniz ilköğretim okullarında uygulama izin talebi incelenmiştir.

Orta Doğu Teknik Üniversitesi tarafından kabul edilen, onaylı bir örneği Bakanlığımızda muhafaza edilen (6 sayfa - 88 sorudan oluşan) anketin belirtilen ilköğretim okullarında uygulanmasında bir sakınca görülmemektedir.

Araştırmanın bitiminde sonuç raporunun iki örneğinin Bakanlığımıza gönderilmesi gerekmektedir.

Bilgilerinizi ve gereğini rica ederim.

Cumaali DEMİRTAŞ
Bakan a.
Müsteşar Yardımcısı

EKLER :
EK-1: Araştırma Örneği (1 Adet-6 Sayfa)
EK-2: Okul Listesi (1 Adet-1 Sayfa)

T.C.
ANKARA VALİLİĞİ
Milli Eğitim Müdürlüğü
Gelen Evrakın No : 1285
Gelen Evrakın Tarihi : 21 / 04 / 2006
Evrakın Gittiği Bölüm : Kültür

563
24.04.2006

EĞİTİME %100 DESTEK

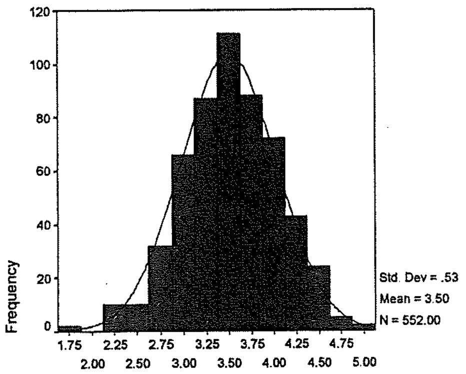
DANIŞMA 444 0 632 HATTI

G.M.K. Bulvarı No: 109
06570 Maltepe / ANKARA

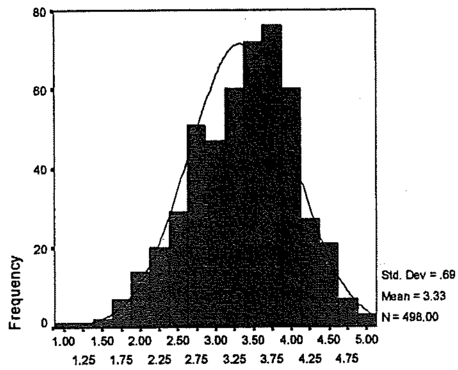
Tel (0312) 230 36 44
Faks (0312) 231 62 05
e-posta: earged@meb.gov.tr

L. HISTOGRAMS FOR PRESERVICE AND INSERVICE TEACHERS' PERCEPTION OF TEACHING AND COMPETENCIES OVER THE YEARS

Perception_2



Perception_3



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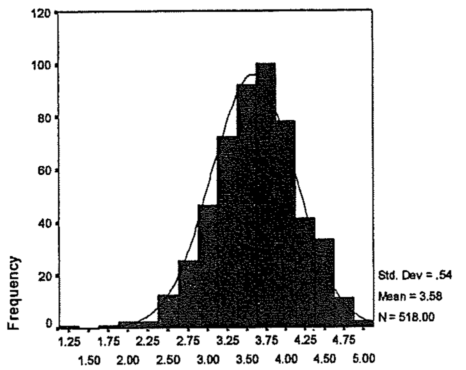
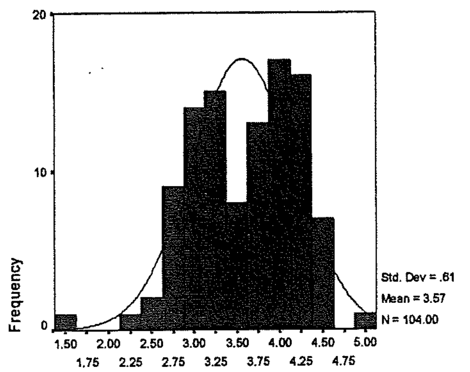
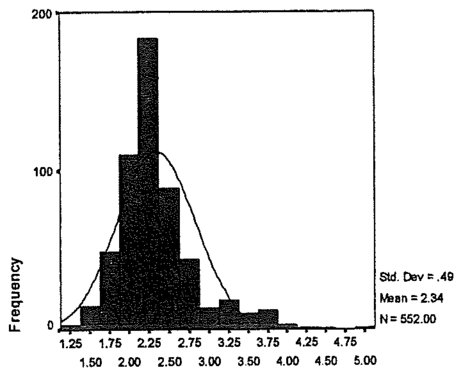


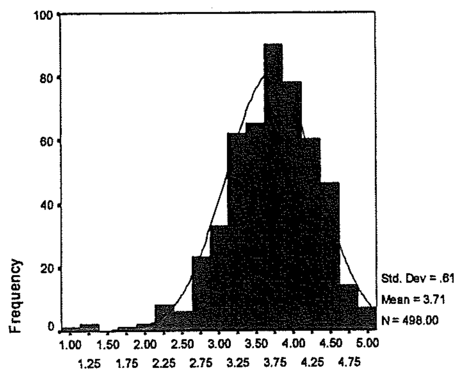
perception_inservice



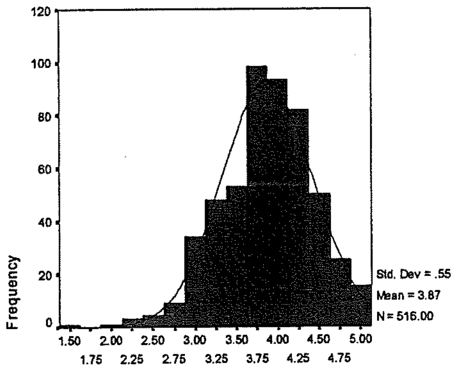
pedagoji_2



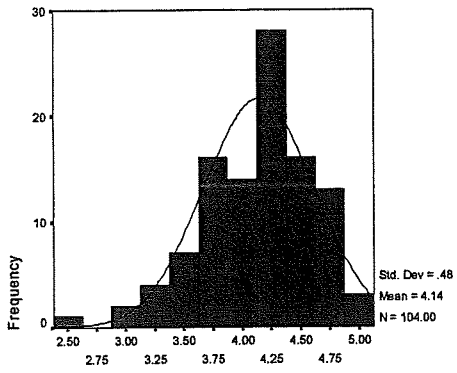
Pedagoji_3



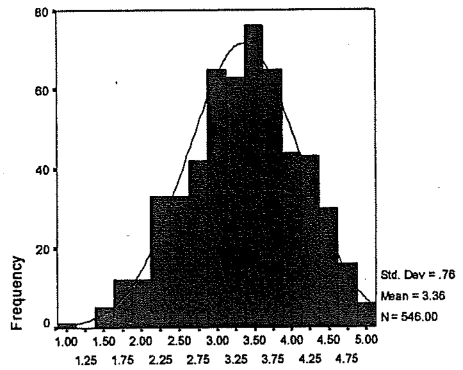
Pedagoji_4



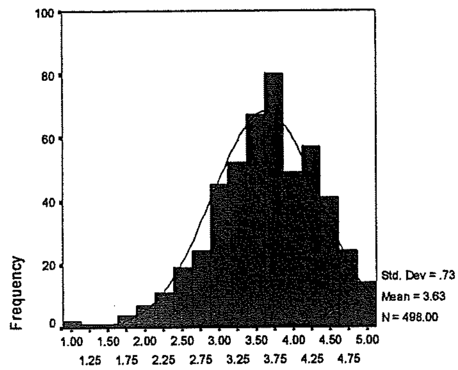
pedagoji_inservice



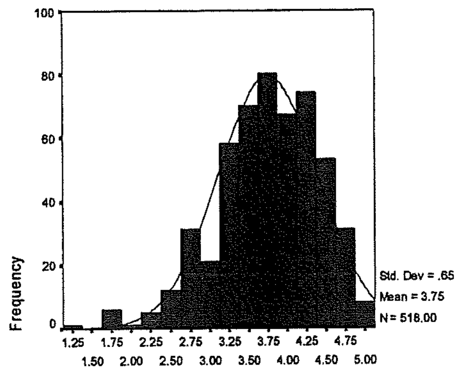
Subject matter_2



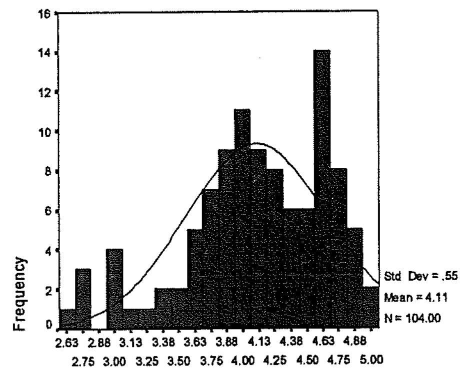
Subject matter_3



Subject matter_4

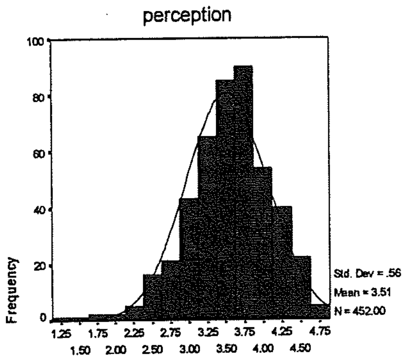


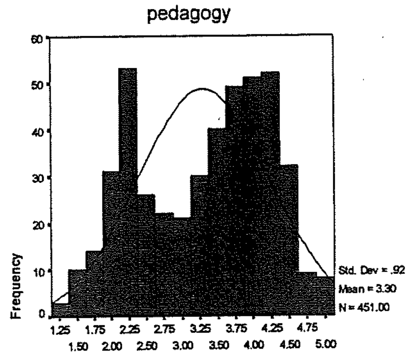
Subject matter_inservice

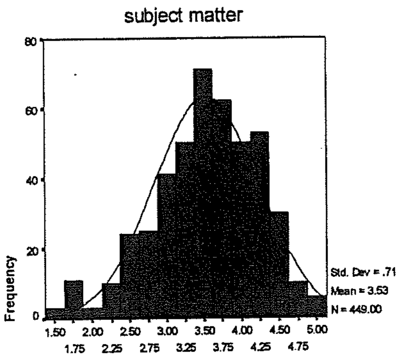


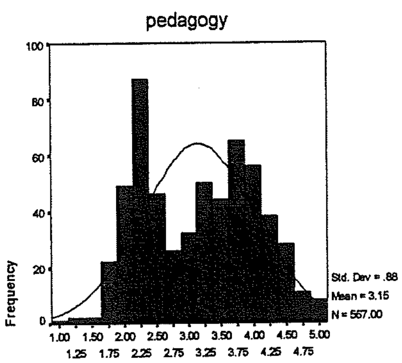
M. HISTOGRAMS FOR PRESERVICE TEACHERS' PERCEPTION OF TEACHING AND COMPETENCIES BASED ON THEIR HIGH SCHOOL BACKGROUNDS

1. General high school

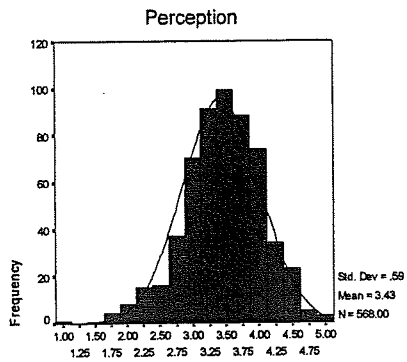


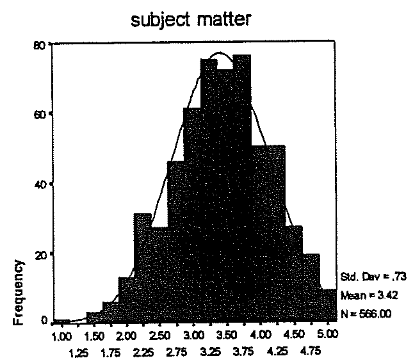




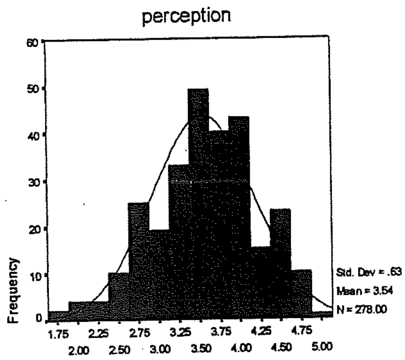


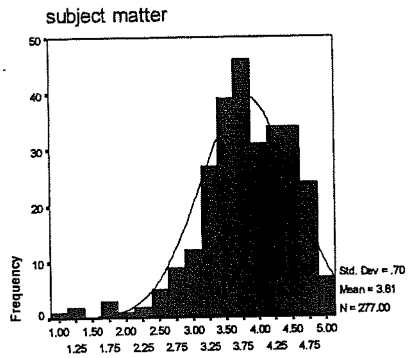
2. Anatolian high school

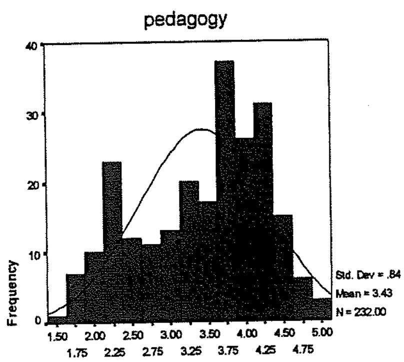


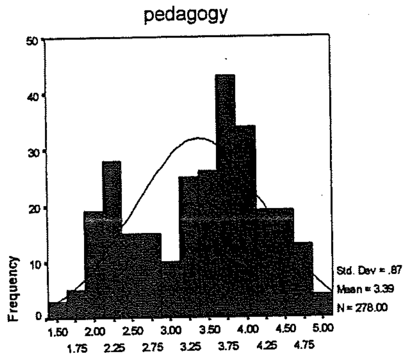


3. Vocational high school

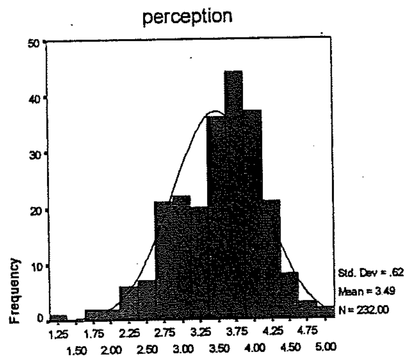


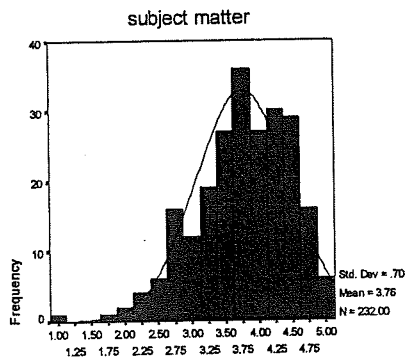




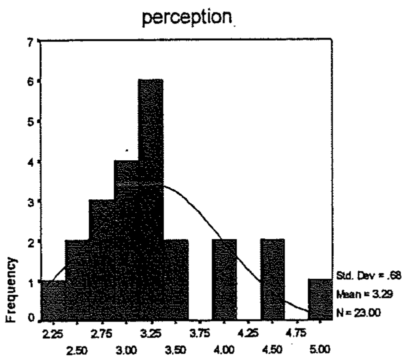


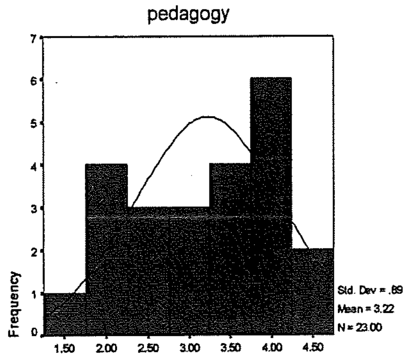
4. Anatolian vocational high school

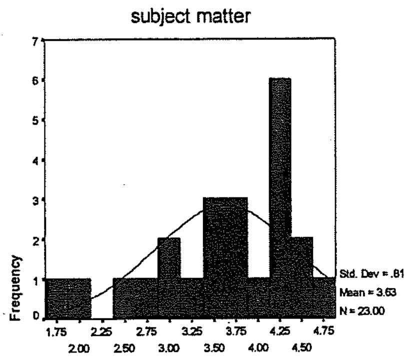




5. Science school







N. QUOTATIONS FROM THE PRESERVICE TEACHERS' INTERVIEWS

"Bilgisayar dersine öğrencilerin çok istekle ve heyecanla geldiklerini görüyorum, laboratuvara girmek için adeta birbirleri ile yarışıyorlar. Kanımca öğrenciler bilgisayar dersini cok seviyorlar, dolayısı ile bu beni çok sevindiriyor. Ayrıca, bana gelip yeni öğrendikleri şeyleri heyecanla anlatmak istemeleri de çok güzel." [1]

"..internet deniz derya her şey var orda.....öğrencilere interneti nasıl kullanacaklarını, kaynaklara nasıl ulaşacaklarını öğretiyoruz, bu da diğer derslerde daha da başarılı olmalarına yol açıyor... Öğrenciler bizi çok seviyorlar, sürekli yeni ve ilgili şeyler öğrenmek onların hoşuna gidiyor." [2]

"..öğrenciler bilgisayar dersine eğlenme zamanı olarak geliyorlar, sadece oyun oynayalım birbirimizle konuşalım diye derse geliyor. Dersin not kaygısı olmadığından, öğretmeni de çok fazla ciddiye almıyorlar, labta sen ne dersen de onlar bildiklerini yapıyorlar, bu da beni oldukça sinir ediyor ama bir şey de yapamıyorsun, çünkü not önemli olmadığı için onların dikkatlerini çekmek için başka yöntemler uygulamak zorunda kalıyorsun, örneğin oyun oynamayı yasaklıyorum o zaman da ben kötü hoca oluyorum." [3]

" bazı öğrenciler hayatında bilgisayar görmemişken bazıları çok fazla şey bilmekte, dolayısı ile sınıf içinde herkesle aynı seviyede ilgilenmek oldukça zor olmakta, bir de sınıflar kalabalık bilgisayar sayısı az olduğunda ortam çekilmez bir hal alıyor."[4]

".. okullara öğretmenlik uygulaması için gittigimizde bir hafta "mouse nedir, klavye nasıl kullanılır" bunu anlatmamız söylendi, oysa öğrenciler zaten bunları biliyorlar. Onların teknolojiyi öğrenme konusunda çok istekli olduklarını görüyorum ama öğretmen olduğumuzda sanki elimiz kolumuz bağlanacak gibi görünüyor, oysa teknoloji bunların çok çok ötesinde..."[5]

"...ögrencilerin yaşları küçük, onların seviyelerine inmeliyiz, seviyeleri farklı, düzeyleri farklı bu da bizi zor durumda bırakıyor, laboratuvara geldiklerinde hep internete girmek ya da oyun oynamak istiyorlar..." [6]

"...öğrenciler dışarda nerde beni görseler koşarak yanıma gelirler "Hocam şunu biliyor musunuz? Bu nasıldır?" diye internette yeni gördükleri şeyleri bana anlatmaya çalışıyorlar. Hatta öyleki bazen benim bile duymadığım şeyleri soruyorlar bana, bu da beni sürekli gündemde tutup onlarla ilgilenmemi gerektiriyor." [7]

"...bilgisayar öğretmeni olarak öğrencilerin gözünde ayrı bir yerimiz var gibi düşünüyorum hep, öğrenciler bizi çok seviyor, onlara yeni teknolojiler hakkında bilgiler veriyoruz, bu da onların çok hoşuna gidiyor, çok meraklılar yaşlarının küçük olmasına rağmen yeni şeyler öğrenmeye çok hevesliler, bu da bende iyi bir iş yaptığım kanısı uyandırıyor." [8]

"... öğrenciler farklı bir ortama gelmiş gibi hissediyorlar kendilerini, bilgisayar laboratuvarında... görsel olarak zengin bir ortam sağlandığı için çok hoşlarına gidiyor bu durum..." [9]

"... 1. sınıfta öğretmen olma isteğim çok yüksekti sonra gitgide düstü, şimdi istemiyorum mesela öğretmen olmayı..."[10]

"...öğretmen olmayı kesinlikle düşünmüyorum, yaparsam zorunluluktan yaparım. Her şey rutin, hep aynı konuyu anlat. Dönüp her sene aynı şeyleri anlat. Bana göre değil bu meslek.." [11]

"..Benim üniversite sınavında ilk tercihimdi çok istiyordum öğretmen olmayı, annem babam da öğretmen benim, ama gün geçtikçe bu isteğim düştü, bu öğretmenlik benim istediğim, hayal ettiğim öğretmenlik değil." [12]

"Öğretmenlik yapmayı seviyorum, ama öğretmenlerin durumu içler acısı, öğretmen olduğumda maaşın yetip yetmeyeceğini düşünmek istemiyorum tek düşüncem daha nasıl iyi öğretmen olunur olmalı.." [13]

"...Ne olacağımız belli değil açıkçası, sanırım öğretmen olurum... bir de KPSS sınavı var, ne ölçtüğü belli olmayan, okuduğumuz bölümle alakası olmayan konulardan sorumluyuz, iyi de bu bizi daha iyi öğretmen yapmıyorki..." [14]

"...Öğrencileri seviyorum, bildiklerimi paylaşmayı çok seviyorum. Kendimi sürekli güncellemeyi seviyorum, öğretmenlik yaparım, tam bana göre bir meslek..." [15]

"... bilgisayarı ve teknolojiyi anlatmak, öğrencilere bunlar hakkında bilgiler vermek çok eğlenceli geliyor bana..." [16]

"...bazı disiplin sorunları olabiliyor zorlukları olabiliyor ama labaratuvar derslerinde daha çok yoruluyoruz çünkü ögrencilere sürekli koşup bilgisayarlarına bakmak zorundayız ama daha eğlenceli bir ortam." [17]

"... Biz teknolojiyi ne kadar benimsersek onu ne kadar iç içe olursak o kadar topluma faydalı oluruz diye düşünüyorum, özverili olmalıyız, farkımız olmalı..." [18]

"...bilgisayar öğretmenliği diğer branşlara göre daha zevkli bir meslek, uygulamalı, teknoloji ile iç içe, özel sektörde falan çalışılabilir..." [19]

"...diğer branşlara göre daha çekici, teknoloji sürekli değişiyor, kendini yenilersen hiç sıkılmazsın. Öğretmenken takip etme olanaklarımız endişelendiriyor beni..." [20]

".. bana göre okullarda bilgisayar öğretmek çok özellik isteyen bir meslek değil aslında, çok da zorlanacağımı düşünmüyorum öğretmenlik yaparken..." [21]

"...Bilgisayar öğretmeninden çok fazla şey bekleniyor, bize okulda başkalarının bilgisayarları nasıl tamir edilir, veya bunu yapmaktan nasıl kaçınılır diye de bilgi verilmedi, bunları gördükçe işimizin çok karmaşık olduğunu görmeye başladım." [22]

"...okullarda bilgisayar öğretmeninin rolü düşünüldüğünden çok farklı görünüyor. Okullarda bozulan bilgisayarları yapmak, okul idarecilerinin veya diğer öğretmenlerin bilgisayar sorunlarını çözmek bizim işimiz değil bence. Biz onca sene bunlar için eğitim almadık ki. Okullarda bizi hep teknik elemanmışız gibi goruyorlar, bu durum beni korkutuyor açıkçası..."[23]

"Okuldaki idarecilerin, bilgisayarlarını tamir etmek bizim işimiz olmamalı, öğrenciler teknolojiyi kullanarak dersi nasıl daha iyi anlarlar bunu yapmalıyız. Öğretmenlere bunun kullanımında yardımcı olmalıyız." [24]

"...bilgisayar öğretmenliği diye bir meslek bana tuhaf geliyor teknoloji öğretmenliği dense daha iyi bence, bilgisayarı değil onun nasıl kullanıldığını öğretmemiz lazım, ayrıca sadece öğrencilere değil okuldaki diğer öğretmenlere de..." [25]

"...Bilgisayarı ben bir araç olarak görüyorum, bilgisayar öğretmenliğinin yeterli ve önemli olduğuna inanmıyorum..." [26]

"...Başka branştan olanlar da bilgisayar öğrermenliği yapıyor, bu çok saçma geliyor bana, çünkü hem bunun eğitimini almamışlar hem de bilgileri çok yeterli değil. Kendi işleri gibi görmüyorlar zaten, dolayıısı ile öğrenciler de nefret ediyor onlardan." [27]

"Okulda ne görüyorum diye kafam karışıyor, örneğin branş öğretmeni gibi görmüyorum kendimi. Zaman zaman piyasada calışma isteğim artıyor bu yüzden, imkanımız çok belki de piyasada çalışabilirim..." [28]

"...Bilgisayar öğretmeni olacağım ama öğretim teknolojileri öğretmeni değil, bu ne demek bilmiyorum. ...çünkü ben bilgisayar ve öğretim teknolojileri öğretmeni olarak görüyorum kendimi aslında, ...Ama diğer kısmı hiç kullanılmıyor genellikle..." [29]

"...bilgisayar öğretmenliği diye bakmamak gerekir bence interdisiplinary bir alan bizimkisi... ...diğer derslere materyal hazırlamalı veya öğretmenlere bunları hazırlamada yardımcı olmalıyız, ...Her derste teknoloji kullanılmalı kesinlikle, bunun için de bizlere çok iş düşmekte..." [30]

"...çocukların merakı giderilmeli ayrıca, şu monitör, bu yazıcı falan demek kesinlikle yeterli değil. Oyunsa oyun da oynayabilmeliler yeri geldiginde... ayrıca interdisciplinary meslek bizimkisi. BDE katkıda bulunmalıyız, onu uygulamalıyız, diğer öğretmenlere yardımcı olmalı, materyal bulmasına hazırlamasına." [31]

"...her derse entgre edilmeli bilgisayar. Biz yardımcı olmalıyız. Öğrenciler zaten bilgisayarı tanıyor. Bir daha bilgisayarı tanıtmak ne kadar gerçekçi. Dolayısı ile bizlere sadece bilgisayar öğretmeni diye bakılması hoşuma gitmiyor mesela." [32]

"...anlamadığım bir şey de ders planı yapmak, evet zorunlu olarak yapıyorum, ancak buna uygulama yaparken uydugumu hiç söyleyemem. Laboratuvardayız, orada planın çok önemi yok bence..." [33]

"...derse girmeden önce detaylı bir plan hazırlamıştım, öncesinde öğrencileri tanıdığımdan zayıf olan öğrencileri de derse katacak şekilde yaptığım plana uymaya çalıştım ve ders oldukca keyifli geçmişti..." [34]

"...öğrenciler genelde bilgisayarı çok sevdiği halde, nerde nasıl kullanacaklarını bilmek istiyorlar, excel anlatacaksın mesela niye onu kullanmalarının lazım olduguna dair örnekler getirmelisin sınıfa.. Örneğin bir alışveriş listesi hazırlamalarını istemiştim, onların da çok hoşuna gitmişti bu..." [35]

"Yeni bir konuya başlamadan önce quiz gibi bir şey yapıp onların seviyelerini belirliyorum Ders anlatırken öğretim metodunu rastgele belirliyorum, orda plana uymak zor oluyor. Soru cevap yöntemi veya düz anlatım bazen de karışık yöntemler uygulamaya calışıyorum...[36]"

"Sıkıldıklarını anladığınız anda, konuyu dağıtıp başka şeylerden bahsetmek gerekiyor, günlük hayattan örnekler veriyorsunuz ki derse karşı ilgisini çekebileyim. Sonra derse dönüp kaldığımız yerden devam ediyoruz." [37]

"Derse katılmayan öğrenci ile daha yakından ilgilenerek derse katılımını sağlıyorum. Öğrencilerin motivasyonlarının zaman zaman düştüğünü görüyorum, bu durumda kesinlikle onların derse ilgisini çekecek bir şeyler bulmak zorundayız, gerekirse oyun oynamalarına izin veriyorum." [38]

"...öğrenciler laboratuvara geldiklerinde başka bir dünyaya gelmiş gibiler, diğer derslerde bulamadıkları özgürlüğü burda bulmak istiyorlar, bazen sınıfta hocanın olduğunu bile unutuyorlar, o yüzden öğretmenin sınıfta öğrencilerle iletişimi koparmaması gerekiyor." [39]

"...öğrenciler laboratuvara geldiklerinde bizi dinlemek istemiyorlar, varsa yoksa düşünceleri bir an önce bilgisayarı açıp oyun oynamak ya da öğrendiği yeni bir seyi uygulamak, bizimle ilestişimlerinin iyi olması gerekiyor aslında..." [40]

"...bilgisayar dersi 1 saat, öğrenci girip çıkarken zaten 15 dakikasını harcıyor, ondan sonra oturun susun diyene kadar dersin yarısı geçmiş oluyor, kalan zamanda elindekileri uygulamak için kesinlikle yeterli değil." [41]

"... derste zar zor anlatmam gerekenleri bitirebildim, geri dönüt alacak zamanım olmadı, olsa herhalde kısa bir uygulama yaptırıp konunun öğrenilip öğrenilmediğine bakardım." [42]

"...dersi anlatıp bitirdiğimde, değerlendirmesini yapamadım, sınav mı yapmalıydım, uygulama mı yaptırsaydım bilmiyorum, zamanım da çok yoktu zaten, öğrencilere de söz vermiştim oyun oynatmak için, onlar da oyun oynamak istiyorlardı..." [43]

" yeni mufredatı bilmiyoruz mesela, bir derste materyal geliştirme dersinde, fen ve teknoloji muredatı yenilendiği için hocamız bizden flashla materyal hazırlamamızı istemişti, keske bize daha fazla bilgi verseler... örneğin ben bu mufredatta değerlendirme metotlarını duymuştum ama nasıl yapılacağı hakkında hiç bilgim yok, ve bizim alanla ilgisi var mi onu da bilmiyorum " [44]

"...çocuklar derse bir heyecanla geliyorlar, bizi dinlemeden hemen bilgisayarları açıp oyun oynamak istiyorlar, bir gürültü uğultu kopup gidiyor, onları susturmakta zorlanıyorum. Dersin kredisi olmadığı, çocukların not kaygısı olmadığı için bizi dinlemeye de yanaşmıyorlar..." [45]

"...The students come to the class with great excitement. They do not listen to us and they want to log on the computers and to play computer games. There emerges a very big noise and I have difficulty in providing silence. The students do not listen to us since they do not take exams in the computer course..." [45]

"Çocuklar derse geldiklerinde bilgisayar laboratuvarını zaten oyun oynama zamanı olarak görüyorlar, çok fazla gürültü yapıyorlar başta. Ben bu durumda onlara ceza vermeyi yeğliyorum ki bir daha yapamasınlar. Kontrolden çıkan öğrencilere ceza veriyorum, örneğin bilgisayarları temizleme gibi... Orjinal yaptırımlar uyguluyorum bazen, herkesin dikkatini çeken, bir daha yaramazlık yapmamalarını sağlamak için..." [46]

"Öğretmenlik uygulaması stajını çok az buluyorum ben, bir dönemde bir şey anlamıyoruz, keşke daha uzun yapabilsek... okulda gördüğümüz metotları veya pedagojik derslerin anında uygulamasını yapıp sonuçlarını tartışsak biz de daha kalıcı olur kanaatindeyim." [47]

"....Hocalarımız bize öğretmenlikte tecrübenin çok önemli olduğunu hep söylüyorlar, bunu kabul ediyorum ama tecrübeyi öğretmen olmadan elde edemez miyiz diye düşünüyorum ben... ...stajlara daha fazla gitsek örneğin." [48]

"... ilk öğretimde öğretmenlik yapacağız madem onlarla ilgili daha fazla pedagoji dersleri almalıyız. ...örneğin ben kendimi çok yeterli görüyordum ama eksik olduğum noktalar olduğunu gördüm... çocuk psikolosjisi mesela bizim bunu öğrenmemiz gerekiyor öğretmenlik yapmaya başladığımızda.." [49]

" ....bizim işimiz bilgisayarı anlatmak ise öğrencilere, araya bir üçüncü şey giriyor öğrencilerle aramıza, bilgisayar, dolayısıyla duymuştum bir yerde bilgisayar insan iletişimi diye ya da buna benzer bir ders almalıyız ki sınıfta öğrencilerle iletişimimiz daha iyi olsun."[50]

".... eğitim felsefesi mesela, bunu hep merak etmişimdir, kesinlikle bize böyle bir ders verilmeli diye düşünüyorum"[51]

"...kendimi teknik anlamda çok yeterli görmüyorum açıkçası, o kadar çok öğrenilecek şey var ki. Ama dediğim gibi bilgim okulda öğretmenlik yapmaya ziyadesi ile yeterli. Fakat kendimizi sürekli yenilememiz gerektiğini de biliyorum..." [52]

"...teknik anlamda kendimi okulda öğretmenlik yapacak kadar yeterli görüyorum, ama kendimizi yenilemeliyiz, flash dreamwaver gibi programları falan bilmeliyiz."[53]

"...Bizim gördüğümüz meslek dersleri word excel işte yani çok basit bölüme başlarken daha fazla teknik konulara eğileceğimizi düşünüyordum, yıllar geçtikçe hevesim içimde kaldı açıkçası. Bunları zaten çok önceden biliyorduk, hatta bugün okullardaki pek çok öğrenci bunları biliyor. Bunların yanı sıra bize daha gelişmiş konuları da öğretseler çok güzel olurdu..." [54]

"...konulara hakimim ama sürekli güncelliği korumak lazım, sürekli gelişen bir şey bu teknoloji. Takip etmek zor ama mecburuz. Okulardaki müfredata bakınca bir şey yok, bunlar kesinlikle değişmeli..." [55]

"...okullarda öğretmenlik yapabilmek için çok fazla teknik bilgi bilmemize gerek olmadığını düşünüyorum. Okullardaki müfredat teknolojinin gerisinde, bu mutlaka gözden geçirilmeli mümkünse her yıl yenilenmeli, çünkü teknoloji o kadar hızlı ilerliyorki buna ayak uydurmak için çocukların bir an önce gelişen teknolojiyi görmeleri gerekir, zaten müfredattaki konuları biliyor, onlar da yeni seyler öğrenmek istiyorlar"[56]

“.. okullarda bizi sadece bilgisayar öğretmeni olarak görmelerini doğru bulmuyorum ben. Bizim işimiz sadece bilgisayarı anlatmak değil, diğer öğretmenlerle de işbirliği yapmalıyız, her derste teknloji kullanılmalı, burda da en önemli iş bize düşüyor kanısındayım.” [57]

“...bizim bir de öğretim teknoloğu boyutumuz var, bunun daha çok ön plana çıkması gerektiğini düşünüyorum ben. Gittiğimiz okullarda BDE’ye çok önem vermeliyiz. Diğer öğretmenlere materyal hazırlamaları konusunda yardımcı olmalıyız her zaman... Üniversitede de buna yönelik derslerin çok olması gerekir bence.” [58]

“... nasıl okullarda staj yapıyorsak aynı şekilde piyasada da yapmalıyız... onlar (şirketler) pek çok yazılım geliştiriyorlar, hem bunları nasıl geliştirdiklerini öğrenmiş oluruz hem de bunlar hakkında bilgi sahibi olmuş oluruz, böylelikle gittiğimiz okullarda bunları kullanmak konusunda diğer öğretmenlere de yardımcı oluruz.”[59]

“...üniversitede okutulan teknik dersler çok basit geliyor bize, tamam bunlar da olsun ama, bunların yanısıra yazılım geliştirebilecek dersler ya da bu yazılımları değerlendirmeye ve kullanmaya yönelik derslere ağırlık verilse daha faydalı. ”[60]

“...okullarda bilgisayar sayısının az olması hiç iyi bir durum değil, bir bilgisayara 3 öğrenci düşüyor, bu da etkili öğretmenlik yapmamızı engelliyor tabiki.” [61]

“Özel okullarda bir öğrenciye bir bilgisayar düşerken devlet okullarında bir bilgisayara 3-4 öğrenci düşüyor, öğrenciler etkili kullanamıyorlarki... laboratuvar ortamları da çok sağlıklı değil kanımca, mutlaka yeniden düzenlenmeli...” [62]

“... okullarda bilgisayar öğretmenleri teknik elemanmış gibi görülüyor, okul idarecilerinden tutun okuldaki diğer öğretmenlere kadar herkes bilgisayar öğretmenlerinden okuldaki bilgisayarlari tamir etmelerini bekliyor... ...ama bizim işimiz değil ki bu... biz bunlara mı bakalım derse mi odaklanalım?” [63]

“ Teknik eleman ile bilgisayar öğretmeninin farkı belli olmalı, ben herkesin bilgisayarını tamir etmek için eğitim almadım ki... okuldaki öğretmenlere yardımcı olalım onlara BDE konusunda destek olalım ama özel bilgisayarlarına da biz bakmayalım artık...” [64]

“..bilgisayar ders sayısı çok az, öğrencilerin not kaygısı yok, onlar LGS sınavına hazırlanıyorlar, bilgisayar dersini sadece oyun olarak görüyorlar... halbuki onların sınavlarına hazırlanışına çok güzel kaynak teşkil ediyor bilgisayarlar keşke buna yoğunlaşabilseler okullarda, ama tam tersi oluyor genelde. Ne öğrenciler bu durumun farkında ne de diğer öğretmenler buna teşvik ediyorlar... herkes kendi dersinin çok önemli olduğunu vurguluyor.” [65]

“Uygulamaya gittiğim bir okulda okul müdürü bir labaratuvarı kullanıma açmamış, okulda da bilgisayar öğretmeni askere gitmiş bana zimmetli, bozulursa ben sorumluyum, dolayısı ile laboratuvar kullanılmıyor, öğrencilerin kullanımına açık değil, hâlâ daha bu şekilde idarecilerin olması beni çok şaşırtmıştı.” [66]

“...bazı öğrenci velileri bilgisayar öğretmenlerini hiç dikkate almıyorlar, hatta bazıları onları sevmiyor bile, çocuklarına oyun oynattırdığı için, onların tek derdi çocuklarının okulda ve LGS sınavında başarılı olması, bilgisayar veya teknoloji bilmeleri umurlarında bile değil, dolayısı ile bu da bizi oldukça etkiliyor..." [67]

"...bilgisayar öğretmenlerine çok düşük maaş verilmektedir, gerçi bütün öğretmenlerin maaşı düşük bence, bilgisayar öğretmenlerine daha fazla maaş verilmesinden yanayım, öyle olmadığı müddetçe bu öğretmenler yasal olmamasına rağmen başka alanlara kayabiliyorlar, ne bileyim web masterlık gibi ya da bilgi işlem merkezlerinde..." [68]

"Bence bu mesleğin adı da degişmeli Bilgisayar öğretmenliği kulağa cazip geliyor belki ama prarikte hiç de öyle değil." [69]

" Öğretmenlik deneyimine gittiğim okuldaki bilgisayar laboratuvarında bilgisayarlar iç içe dizilmiş. Bu laboratuvarda yürümek hatta nefes almak bile çok zor. Öğrenciler sınıfa girdiğinde laboratuvar tıka basa dolu oluyor... öğrencilerin ve öğretmenlerin rahat ve sağlıklı kullanmaları için bilgisayar laboratuvarı temiz olmalı...gittiğim okuldaki laboratuvarda bazı bilgisayarlar bozuk bazıları da kullanılabilir durumda değil... bu benim ilerisi için cesaretimi kırıyor." [70]

"...bence okullarda müfredata paralel ders anlatmak gercekten içler acısı...bunları öğreteceğimizi beklemiyordum... okullarda müfredatı anlatmak öğrenciler için iyi değil" [71]

"İlk sene ortama alışma bölüme adapte ile geçti, ikinci sene neyin ne olduğunun farkına varmaya basladık. Baslangıçta beklentim yüksekti, gitgide düştü, bilgisayar öğretmek için okulunda okumaya gerek yok." [72]

" Bir kaç gün önce bir öğretmene ne kadar ücret aldığını sordum. Aldığım cevap karşısında şok olduğumu söyleyebilirim. Öğretmenlerin daha fazla aldığını zannediyordum. Bence öğretmenler bu maaşla yaşayamazlar ki... benim üniversitede harcadığımdan daha az maaş alıyorlar... açıkçası bu durumu öğrendikten sonra öğretmenlikten başka bir iş aramaya başladım..."[73]

"Bilgisayar öğretmenleri mutlu değiller... onlar sadece günü kurtarıyorlar... ama açıkçası teknolojideki gelişmeleri takip etmeliler... ayrıca, okuldaki diğer öğretmenler de kendi derslerinde teknolojiyi kullanmalılar, bilgisayar öğretmenleri de onlara yardımcı olmalıdır... herkes görüyorki teknoloji çok hızlı gelişiyor.. açıkçası bilgisayar öğretmeni olarak bu gelişmeleri takip etmeliyiz. Fakat bu çok kolay değil ve ben bunu sürekli yapamayacağımdan endişeleniyorum..." [74]

" KPSS'nin nedenini türlü anlayamıyorum. Sürekli sınav hakkında rüyalar görüyorum... çok anlamsız bir sınav bizim üniversitede geçirdiğimiz 4 yıllık eğitimimiz hiçe sayılıyor. Madem öyle, bizim üniversiteye gitmemizin ne anlamı var, liseden sonra bu sınav için hazırlansak " [75]

"Bu sınava girmeyi bir şekilde anlıyorum ama bu sınavda alanımızla ilgili sorulara da yer verilmeli ve bunlara göre atamalar yapılmalıdır... bu sene benim üniversitedeki son yılım ve ben bütün vaktimi bu sınava hazırlanmakla geçiriyorum, başka bir şey yapmıyorum..." [76]

"Açıkçası zaman zaman bu mesleğin beni tatmin etmeyeceğini düşünüyorum. Diğer sektörlerdeki fırsatlar başka bir iş yapmak için bana daha cazip geliyor." [77]

O. QUOTATIONS FROM THE INSERVICE TEACHERS' INTERVIEWS

"Ögrenciler laboratuvara, sadece oyun oynayalım ve chat yapalım diye geliyorlar. Hemen hemen herkesin bir email hesabı var bazıları msni kullanmayı da biliyor, bilmeyenler de heyecanla birbirlerine anlatıyorlar, dersin büyük bir kısmı onları yerlerine oturtmak ve susturmakla geçiyor." [1]

"Çocuklar bilgisayarı seviyor ama, ders olarak görmek istemiyorlar. Sadece gelelim ve eğlenelim düşüncesindeler, 2 yıldır bu durum hep böyle sürdü. Başlarda buna müdahale etmiştim ama artık pek de müdahale etmiyorum. Zaten ders saati çok az." [2]

" Ögrenciler bilgisayar dersinin önemini bilmiyorlar, her ne kadar biz bunu anlatmaya calışsak da, onların derdi sınavlar, yani LGS, OKS türü genel sınavlar. Bence bu tarz sınavlarda bilişim ve teknolojiye yönelik de sorular çıkmalı ki öğrenciler bilgisayar teknolojisine karşı daha ilgili olsunlar, bilgisayarın sadece oyundan ibaret olmadığını bilsinler." [3]

"Öğrenciler bilgisayar laboratuvarına geldiklerinde, akıllarında sadece oyun oluyor. İçeri girer girmez hemen bilgisayarda oyun oynamaya başlıyorlar. Onlara oyun oynamaları için izin vermedigimde, benden nefret ediyorlar ve ben böylece kötü öğretmen oluyorum." [4]

"...benim sınıfımdaki bazı öğrencilerin bilgisayarlar ve ofis programları hakkında epey bir bilgileri var. Hatta bazılarının internet adresi dahi olduğunu söyleyebilirim... düşünebiliyor musun bazıları blog gibi şeyleri bile kullanıyorlar. Fakat bazı öğrenciler bilgisayar hakkında hiçbir şey bilmiyor, hatta bazıları bilgisayarı ilk defa burda görüyor. Şimdi bu mesleğin sıkıntılarını daha iyi anlayabiliyor musunuz?" [5]

"Bilgisayar dersi bence çok anlamlı değil. BDE uygulamalamalarına daha çok ağırlık vermeliyiz, bu şekilde öğrenci zaten konuyla birlikte bilgisayarı öğreniyor ve öğrendiklerini hayata daha çabuk geçirebiliyor." [6]

"Bilgisayar destekli eğitim olanakları sağlanmalı, sadece bilgisayar laboratuvarlarında öğrenciye bilgisayar anlatmak artık yeterli değil bence, öğrencilere daha zengin ve eğlenceli öğrenme ortamları sağlamak için her derste bilgisayar kullanımı sağlanmalı." [7]

"Bizim okul müfredatına göre bir klavyeyi iki hafta tanıtıyorsun öğrencilere, onlar zaten klavyeyi biliyorlar... çok komik geliyor bana bunlar... ben açıkçası hiç müfredata uymuyorum." [8]

"Geçen sene 3. sınıflara yazıcıyı tanıttım, hem de iki hafta, sonra bu sene 4. sınıfta tekrar yazıcı tanıtmam gerekiyor müfredata gore... iyi de teknoloji gelişiyor ama yazıcılar anlamında değil ki sadece..." [9]

"Bilgisayar kullanımı sadece bilgisayar dersleri ile sınırlı kalmamalı, değişik imkanlar sağlanarak öğrencilerin bilgisayarlar ile iç içe olmaları sağlanabilir. Örneğin öğrencilere okul saatleri dışında teknolojiyi kullanabileceği ortamlar yaratma olabilir... ...sadece laboratuvar kurmakla olmuyor bu işler, önemli olan bunları yeterince ve etkili kullanmak..." [10]

" Ben okula atandığımda bilgisayar laboratuvarı yeni kurulmuştu ama düzgün kullanılamıyordu, okul müdürü son model bilgisayarlarının olduğu ile övünüyordu ama ben bu bilgisayarları her derste hatta ders dışı bile kullanalım diye teklif götürdüğümde fikrimi kabul etmemişti, bilgisayarların çok ve yeni olması kullanamadıktan sonra çok önemli değil ki..." [11]

"Öğrencilerin bir çoğu teknolojiyi çok yakından takip ediyor. Dolayısıyla onlara çok da yabancı bir ortam değil. Ayrıca öğrenciler, teknolojik ortamlarda eğitim görmeye istekliler. O yüzden bu teknoloji sınıflarını daha etkin kullanmak gerek... bilgisayar derselerinin dışında, hatta okul saatlerinin dışında da çocuklar gelip, bilgisayarları kullansınlar... internet kafelere gitmelerinden daha iyidir kesinlikle..." [12]

"...çoğu öğrencinin evinde bilgisayar yok, o yüzden okuldaki bilgisayarları mümkün olduğunca fazla kullanabilmeliler... istedikleri zaman, boş saatlerinde gelip bilgisayarları kullanabilmeliler... ama işte buna imkan yok henüz, çünkü tek laboratuvar ve hoca olarak da tek ben varım..." [13]

"Öğretmenlik mesleğini meslek olarak çok seviyorum, çünkü çocukları çok seviyorum, çünkü paylaşmayı çok seviyorum... Bu meslek zaten sevilerek yapılması gereken bir meslek, öğretmenliği sevmeden yapmanın topluma ne zararlar getirdiğini maalesef görüyoruz işte..." [14]

"... Bence öğretmenlikte gönüllülük esastır. Fakat ne yazıkki diğer ülkelerle karşılaştırıldığında Türkiye'de öğretmenliğin şartları oldukça kötüdür. Örneğin maaş... ortalama bir öğretmen maaşı ile geçinmek oldukça zordur..." [15]

"Ben üniversite sınavına girerken hep öğretmenlik işaretlemiştim, garanti meslek diye... Öğretmenliğe ilk başladığım yıl, çok zorlanmıştım, çok sıkıntılar çekmiştim... hatta bırakmayı bile düşünüyordum... sonra yıllar geçtikçe ısındim, işimi ve çocukları sevmeye başladım, şimdi iyi ki istifa etmemişim diye düşünüyorum..." [16]

"Aslında bilgisayar öğretmenliğini diğer öğretmenliklerle karşılaştırırsak zorlukları da var, öğrenci ile arada bir makine var ve bu makine onların ilgisini daha çok çekiyor. Yeni bir şeyler anlatmaya çalışsanız da onlar dinlermiş gibi görünüp ya da sessiz durup dinlememekte ısrar ediyorlar."[17]

"Meslek olarak güzel bir meslek, geleceğin mesleği diyoruz ama artık gelecek değil günümüzün meslekleri arasında yer alıyor. Ama iş yaşamında yeteri kadar önemsenmiyoruz." [18]

"...Öğretmenliğe ilk başladığımda oldukça heyecanlıydım, fakat bilgisayar öğretmenliği zamanla tuhaf gelmeye basladı bana. Bilgisayarı bir makine olarak anlatmak bana anlamsız gelmektedir..." [19]

"Bilgisayar öğretmeninin adı değişmeli, rolleri tanımlanmalı, daha etkili olmak isteniyorsa bizi okullarda teknik eleman gibi görmemeleri lazım, ya da eğer öyleysek bunların da belirtilmesi gerekir. Tamam biz okulun laboratuvarlarındaki bilgisayarlardan sorumlu olalım, gerekirse tamirde yapalım, ama ben tek başıma bu kadarını yapamam, benim yanımda bana yardımcı olacak birileri lazım, bazen öğrencileri kullanıyorum bunun için, bu da ne kadar iyi onu bilmiyorum…" [20]

"…ayrıca okullarda teknik servis olarak görülüyoruz. Sadece onunla kalmıyor aynı zamanda idari işlerin yapılması da bize kalıyor... Geçenlerde okulda bir öğretmen ile bir hademenin soruşturma raporlarını yazdırdı müdür bana, bu benim görev tanımımda yok herhalde… ...Tamam bir yere kadar elimden geleni yapıyorum, ama çok yoruluyorum… teknolojinin okulda yeterince kullanılması için çok çabalıyorum ama çabalarım uğraşılarım bu şekilde olmamalı…" [21]

"Öğretmenlikte 2. yılımdayım. Üniversite sınavında yüksek sayılan puanlar alarak bilgisayar ve öğretim teknolojileri öğretmenliğinde okudum. 4 yıllık üniversite hayatımızda programlama dilleri, flash, simülasyon programları, veri tabanları, uzaktan eğitim, bilgisayar destekli eğitim, eğitim ve bilişim teknolojileri, materyal hazırlama gibi konularda eğitim aldım. Tüm bu eğitimlerden sonra biraz da çağa en kolay ayak uydurabilen bir kitlenin üyesi olarak öğretmenliğe büyük bir azimle başladım. O azim, zamanla öyle köreldi ki anlatamam." [22]

"Benim okulumda formatör öğretmen var… çok iyi anlaşabildigimiz söylenemez açıkçası... bildigi tek şey müfredatta ne varsa onu uygulamak... tamam çok hizmetleri olmuştur elbette, ama artık görevini bitirmişler diye düşünüyorum bu formatör öğretmenlerin ben. Zira kendini yeni çıkan teknolojilere karşı çok yetiştirememiş… dolayısı ile bu işlerin bizlere bırakılması gerekir, zira ben bunun kaç yıldır eğitimini almişim…" [23]

"…zaman zaman işimden korkuyorum... sanırım bunun nedeni benim işimin adı, yani bilgisayar öğretmenliği. Herkes bizim bilgisayarlar hakkında her şeyi bildiğimizi zannediyor. Fakat bunun imkansız olduğu çok açık. Örneğin, geçenlerde bir komşum internet problemini bana sordu, ben de onun problemini çozemedim." [24]

"Bence bilgisayar ogretmenleri olarak, okuldaki diğer branş öğretmenleri ile iletişim kurmalıyız. Bazen diğer öğretmenlere özellikle de bazı eğitim yazılımları hakkında eğitimler vermekteyim. Bu çok önemli bence, teknolojiden sadece biz sorumlu değiliz, diğer öğretmenler de sınıflarında teknolijiyi kullanmalılar." [25]

"….üniversitede anlatılanlar ile okulda uygulananlar farklı, teori ile pratik uymuyor birbirine…" [26]

"Üniversite aldığımız alan ve pedagoji derslerin hiçbir yararına görmedim. Mesleğe başladığım günden itibaren diğer öğretmenlerden ve ders içinde yaşanan olaylardan, öğrencilerin öğrenme durumlarına göre hepsini kendi kendime belirledim…" [27]

" Üniversite egitimim esnasında öğrenci merkezli eğitim üzerinde çok duruldu, şimdi ben de öğrenci merkezli ders anlatmaya çalışıyorum. Tabiki teori ile pratik birebir birbirine örtüşmediği için başlarda zorluk çeksem de sonradan kendi stratejimi belirlemeye basladim." [28]

"…bana tuhaf gelen diğer bir şey de bilgisayar laboratuvarlarında ders planı hazırlamamız... düşünebiliyor musunuz, bizlerden bilgisayar yani bir makine için ders planı hazırlamamız isteniyor, herkes biliyor ki bilgisayar donanımı ve yazılımları her sene değişiyor... Örnegin, MS

Windows 95 için bir ders planı hazırlamak anlamsız geliyor bana, çünkü bu işletim sistemi herkesin bildiği gibi eski..."[29]

"Sürekli etkileşim halindeyim öğrencilerimle. Zaten bilgisayar alanı iletişimi çok canlı tutuyor. Örneğin bir gün öğrencilere mail adresi alma ve mail gönderme konusunu anlattıysam, ertesi gün bana veya arkadaşlarına mail atmalarını isterim. Derslerde öğrenciler anlayana kadar anlatırım, bu da sabırlı ve saygılı bir iletişimi gerektirir." [30]

"Meslek lisesinden mezun olduğum için bu ortamı yani laboratuvar ortamını bilirim... Öğrencilerin ilgilerini ihtiyaçlarını biliyorum... fakat, öğretmenlik öğrencilikten oldukça farklıdır. Bazen öğrencilerin davranışları karşısında şaşırıyorum, bu yüzdendir ki bu meslekte deneyim gittikçe önem kazanıyor." [31]

"Bu arada iki senedir proje tabanlı öğretim modelini uyguluyorum. 6. sınıflara Word'ü ve İnterneti, Google'ı öğretirken bunu bir dergi projesiyle ilişkilendiriyorum. Çocuklar ders işlediklerini anlamıyorlar. Amacın dergi çıkarmak olduğunu düşünüyorlar. İki senedir çok kaliteli iki dergi çıkarttık. Çocuklar dersten çok zevk alıyor ve öğrenme çok hızlı ve kalıcı olarak gerçekleşiyor."[32]

"Üniversitede hocalarımdan, staja gittiğimde öğretmenlerden duyduklarımız hep orda kalıyor ama insan yaşayınca anlıyor. "demek kastettikleri buymuş" diyor içinden.... aslında bu stajlar daha fazla olsa bütün üniversite yıllarına yayılsa, tecrübeyi o zamanlarda kazansak şimdi daha iyi olur diye düşünmekteyim..." [33]

"...üniversite yıllarında pek çok pedagojik dersler aldım... o zamanlar bu derslerin önemsiz olduğunu boşuna zaman harcadığımızı düşünüyordum, fakat şimdi bu düşüncemin tam zıddını düşünüyorum... keşke daha fazla pedagojik dersler alabilseydik. Açıkçası, üniversitede eğitim psikolojisi, eğitim felsefesi gibi ekstra dersler verilmeli diye düşünmekteyim." [34]

"Okulun ilk günlerinde oldukça heyecanlıydım, derse başladım, çocuklar serbest çalışma yapıyorlar ve yeni yüklenen bir oyunu oynuyorlardı. Çocuklar sürekli oyun hakkında bir şeyler soruyorlardı bana. Daha ilk haftam yeniyim sisteme, hem de oyuna... Her şeyi bilmem gerek, sınıfa hakim olmalıyım, ne yapmalıyım, şimdi ne göstersem, ne anlatsam, ne söylesem diye düşünüp duruyorum... Üniversitede gördüklerimi düşünüyorum bir yandan; sınıfa gireceksin, ne yapacağın, neler anlatacağın önceden belli, öğrenciler derse hazır, ağzından çıkacağı bekliyor. İçinde bulunduğum duruma bakıyorum ama hiç de öyle değil." [35]

"...laboratuvarda zaten, herkes konuşuyor, öğrenciler izin alıp arkadaşlarına oyun hakkında açıklamalar yapıyorlar, şifreler, tüyolar veriyorlar ve ben hiç bir şey yapamıyorum. Ne yapmam gerektiğine karar veremiyorum ki... Sürekli gözüm duvardaki teneffüs saatlerinde bir de kolumdaki saatte.. Çabuk geç, çabuk geç... Neyse teneffüs oldu hemen bilgisayarı kurcalamaya başladım, çocukların ne yaptığını anlamaya çalıştım ama panik içinde..." [36]

"...sizin de bildiginiz gibi, bu laboratuvarda bir sınıf için sadece bir ders saati var... bu yeterli mi? Kesinlikle hayır... okul müdürüme, labta bir şeyler yapmak için yeterli zamanın olmadığını açıklayamıyorum... bu yüzdendir ki, sınıfımdaki bütün öğrencilerin ilgisini çekemiyorum..." [37]

"...yeni müfredat hakkında hiçbir şey bilmiyorum ben... sadece müfredatın değistiğini duymuştuk, arkadaşlarımdan birisi yeni program hakkında eğitime katılmıştı, o bir şeyler anlatmaya çalıştı geçenlerde. Fakat açıkçası bu yeni müfredat bizim için bir kaos. Anlaşılır gibi değil, eski müfredat değisti, fakat bu yeni diye iddia edilen programda pek çok karışıklıklar var..." [38]

"...yeni müfredata baktığımda şoke oldum... özellikle de bir bilgisayar öğretmeni olarak, öğrencilerin değerlendirilmesi çok karmaşık geldi bana. Labta öğrencileri değerlendirmek oldukça zordur. Düşündük ki, yeni müfredat buna bir çözüm getiriyor, tam aksine bu kendi başına daha da problemli hale gelmiş... yeni müfredata göre öğrencileri nasıl değerlendireceğimi anlamış değilim açıkçası." [39]

"Şimdiki çektiğim sıkıntılara bakarak, gerçi çok büyük sıkıntılar çektiğim söylenemez de, üniversite yıllarındayken deneyim sahibi öğretmen büyüklerimizden uygulamalara yönelik tecrübelerini dinlesek çok daha güzel olacaktı diye düşünmekteyim.Çünkü, üniversite hocalarımızın anlattıkları hep havada kalıyordu bize... şimdi önemini daha iyi anlıyorum." [40]

"Okul müfredatı çok basit, bunları anlatmak ya da uygulamak çok sorun değil... örneğin, mouse anlatıyoruz, klavye anlatıyoruz falan, ya da word, excel... Ama benim düşünceme göre bilgisayar öğretmeni olarak gelişmeleri yakından takip etmeliyiz, mümkün olduğunca kendimizi sürekli yenilemeliyiz. Biz bilgisayar öğretmeni olarak kendimizi yenilemezsek öğrencilere ve topluma teknolojik gelişmeler hakkında bilgi vermezsek, örnek öğretmen olamayız diye düşünüyorum" [41]

"...öğrencilere teknoloji hakkında bir şeyler öğretecek kadar özellikle de bu eski müfredatı takip edecek kadar kendimi oldukça yeterli görüyorum. Fakat, bu bence önemli değil, önemli de olmamalı.. çünkü, teknoloji o kadar hızlı değişiyorki... bu yüzden, eğer gelişmiş ülkelere ayak uydurmak istiyorsak, müfredatı her yıl yenilemeliyiz." [42]

"Bilgisayar öğretmenleri olarak en büyük sorumluluğumuz bence okuldaki bütün derslere bilgisayar teknolojisini uyarlayabilmemizdir... bu konuda diğer öğretmenlere de iş düşüyor, onlarla beraber işbirliği yapmalı, teknoloji entegrasyonu konusunda ihtiyaç duydukları şeyleri gidermeliyiz..." [43]

"...materyal hazırlamalarına yardımcı olmalıyız diğer öğretmenlerin... örneğin geçen bir matematikçi öğretmen arkadaşa bu konuda yardımcı oldum, beraber internetten indirdiği bir programın calışmasına baktık, o kadar memnun oldu ki... daha sonra öğrencilerin de bunu çok sevdiğini ve eğlenerek öğrenerek dersi dinlediklerini söyledi bana..." [44]

"Okullarda rehber öğretmen gibi çalışmalıyız diye düşünüyorum, okuldaki diğer branş öğretmenlere materyal hazırlamalı onlarla beraber işbirliği içinde calışmalıyız. Böylece onları da teknoloji kullanmalarına teşvik etmiş oluruz... ayrıca öğrencilerin bilgisayar ya da diğer teknolojilerle ilgili sorunlarıyla da yakından ilgilenmiş oluruz... yoksa okulda öğrencilere word, excel anlatarak çok faydalı olacağımızı düşünmüyorum... Öğrenciler diğer derslerde bilgisayarı kullanarak zaten bunları da öğrenmis ve hatta geliştirmiş olacaklardır..." [45]

"Günümüzde en önemli konunun internet ortamında bilgiye, doğru ve gerçek bilgiye nasıl ulaşmak ve onu nasıl kullanmak oldugunu bilmek diye düşünüyorum. Öğrencilere ödev veriyorsun, açıyorlar Google sayfasını buldukları her şeyi kopyalayıp yapıştırıyorlar, doğru mu yanlış mı onu arastırdıkları yok... Ayrıca yazılanları olduğu gibi almaları da sakıncalı... işte biz bunu öğretmeliyiz öncelikle, doğru bilgiye nasıl ulaşılır?.." [46]

"Bize hocalarımız üniversite eğitimimiz boyunca etiklik konusunda yaptıkları tek şey, bir yerden kopyala yapıştır yaptığımızda puan kesmek oldu... Oysa bu konuda bizi bilgilendirseler bu konuda da eğitim verseler daha iyi olacağı kanısındayım..." [47]

" Bilgisayar öğretmenlerine hizmet içi eğitim uygulanmamaktadır. Oysa gelişen teknolojiye ilk önce bizim adapte olmamız lazım, ben elimden geleni yapıyorum fakat bazen yetişemiyorum... dolayısı ile okul müdürleri hatta bakanlık bize bu konuda gerekli desteği sağlamalı, özellikle de üniversitelerle sürekli işbirliği içinde olmalıyız." [48]

"Bir çok yazılım firması teknolojinin gelişmesi ile birlikte ortaya çıkıyor. Hepsi eğitim yazilimi geliştiriyor, bazıları gerçekten çok kaliteli... İste bunları derslerde kullanabilmemiz gerekir... ama branş öğretmenleri bunların nasıl kullanılacağını çok iyi bilmediğinden, bize iş düşüyor. Bizim bu yazılımları değerlendirip, öğretmenlerle işbirliği yaparak öğrencilerin yararlanmasını sağlayabiliriz." [49]

"Geçen bir öğretmen arkadaşımız bir cd ile geldi ve bunda çok güzel bir program oldugunu ama çalıştıramadığını söyledi. Sonra beraberce inceledik cdyi ve öğretmenin işine yarayan kısımları not ettik ve derste öğrencilerine bunu gösterdi... Daha sonra öğrencilerin çok ilgisini çektigini bunu sürekli yapması gerektiğini söyledi..." [50]

"...İnternet'te takip ettiğim siteler, haber grupları, mesleki gruplar, dergiler falan var. Yani çok farklı ve değişik ortamlar var, formal veya informal anlamında. Kimi güvenilir bunların, bazıları da ne kadar güvenilir bilmiyorum... ama bilgisayar öğretmenleri olarak formal bir portalımız olsa, bilgilerimizi orda toparlasak paylaşsak ne güzel olur, örneğin bu konuda milli eğitimin ILSIS gibi ortamını kullanabiliriz diye düşünmekteyim." [51]

"...Okulda bulunan idarecilerin bilgisayar dersini angarya bir ders olarak görmesi bilgisayar öğretmeni olarak derse girme isteğimi azaltıyor, onlara göre bilgisayar dersi çok da önemli bir ders değil... Sorun aslında bilgisayar dersi diye bir ders olmasında bence... Öğrenciler sadece bilgisayar dersinde görüyorlar bilgisayari... diğer derslerde bu lab kullanılmıyor... bence diğer derslerde kullanılması gerekir..." [52]

"Göreve başladığımda bilgi teknoloji sınıfı çok eskiydi. Tümünü yeniledim. Oturma düzenini değiştirdim. Ağ sorunlarıyla uğraştım. Tüm öğretmenler, seminerde çay içip sohbet ederken, ben laboratuvarda sürekli çalıştım. Bilgisayarların içini bile temizledim. Laboratuvar düzenini doğru düzgün yardım almadan kendim yeniledim. 15 saat derse girdiğim halde, sabah 7, akşam 5 okulda kaldım. Tüm bilgisayar sorunlarıyla ilgilendim, resmen amelelik yaptım." [53]

"...okulda bilgisayar laboratuvarı maksimum 20 kişilik olmalı. Üniversitede aldığım eğitime göre, elimizdeki fiziksel alana en çok sayıda bilgisayar yerleştirebilmeyi marifet sanıyordum, gerçek hiç de öyle değilmiş. Hem 30 kişilik hem de 15 kişilik sınıflarım oldu. Bilgisayarda öğrencinin yaptıklarıyla bire bir ilgilenebilecek zaman, imkan olmadıktan sonra bu işten verim aldım demek biraz zor..." [54]

"...tüm yaptığım çalışmaları, ek ders ücreti bile almadan maaş karşılığı yapmış olsam da bana dokunmadı. Asıl dokunan, bilgisayar formatör öğretmeni görevlendirmelerinde 180 saatle sertifika alanların benden öncelikli sayılmalarıydı. Bu nedenle okulumda bir sınıf öğretmeni, bilgisayar formatör öğretmeni oldu. O şimdi öğretmenler odasında sadece mesai dolduruyor ve full ek ders ücreti alıyor. Ben tüm bu işlere ve derslere koşturuyorum ve sadece maaş alıyorum..." [55]

"Biz iki kişiyiz, diğer arkadaş sadece teknik işlerle ilgileniyor, formatör öğretrmenmiş, bozulan bilgisayarlari tamir ediyor, okulun web sayfası gibi işlere o bakıyor, ben de öğretmenlik kismı ile ilgileniyorum, aramızda böyle bir anlaşma gibi bir şey oldu gayet de iyi işliyor. İdare de bizi bu konuda destekliyor zaten..." [56]

"...o yüzden, teknoloji sınıfları kurulurken mutlaka düzene çok dikkat edilmesi gerektiğini düşünüyorum hep. Acaba bu konuda biz öğretmenlere hiç soruyorlar mı merak ediyorum." [57]

"...bilgisayarın açılması zaten 5-10 dk. sürüyor, öğrencilere oturun susun derken bir o kadar daha geçiyor... ayrıca bu ders seçmeli bir ders, not kaygısı da yok öğrenciler için... dolayısı ile bizim sınıf içinde etkinliğimiz tamamen sıfıra inmiş durumda... bilgisayar dersi saatinin mutlaka bir şekilde gözden geçirilmesi gerekir." [58]

"Benim dersim seçmeli ders, bu yüzden öğrenciler benim dersime karşı her zaman çok ilgi göstermiyorlar. Bazen bir şeyler öğretmek için cesaretim kırılıyor. Öğrenciler not almayacaklarını bildiklerinden beni dinlemiyorlar. Eğer ders seçmeli olmasaydı bu problemle karşılaşmayacaktım..." [59]

"Öğretmenliğe ilk başladığım zamanlar çok heyecanlıydım. Fakat, bilgisayar laboratuvarını gördüğümde hayal kırıklığına uğradım. Bilgisayarları tamir etmeye çalıstığım bile çok karışık geliyordu. Bence bilgisayar laboratuvarları ilk kurulduklarında bilgisayar öğretmenlerine danışılmalıdır." [60]

"...benim sınıfımda 20 bilgisayar bulunmaktadır. Onların bazıları çok eski, bazıları ise düzgün çalışmamaktadır. Bazı yeni programlar bu bilgisayarlarda çalışmıyor. Okulda baska bir bilgisayar laboratuvarı da yok. Bu yüzdendirki öğrenciler bu laboratuvarı etkin bir şekilde kullanamıyorlar. Oysa bence öğrenciler bu bilgisayarları istedikleri zaman kullanabilmeliler, çünkü onların çoğunun evde bilgisayarları yok. " [61]

"...veliler toplantısında, veliler ben hariç herkesle konuşuyorlar... Ben de ısrarla çocukların bilgisayar dersindeki çabalarından bahsediyorum... ama görüyorum ki maalesef beni dinleyen yok, bu durum cok canımı sıkıyor..." [62]

"...eğitim sisteminin suçu var çünkü kavram karmaşası çözülemedi bir türlü. Her yıl, eski anlamsız konuları anlatmaktan sıkılıyorum... okullarda teknik eleman gibi görüyorlar, bazen işi abartıp fotokopi makinesi bozulsa size başvuruyorlar." [63]

"Henüz tam bir yerimiz bulunmuyor, Mesleğimi yerine getirirken çok zorlandım. Hergün alışmak yerine, istifa etmeyi düşünüyordum. Bu alanın, çok düzenlemeye ihtiyacı var. Öncelikli olarak, 'Bilgisayar öğretmenlerine ihtiyaç var mı?' sorusu sorgulanmalı. Veya şu anki görev tanımlarında düzenleme getirilmeli." [64]

"Bilgisayar öğretmenliği konusunda yaşanan en önemli sorunun görev tanımı olduğunu düşünüyorum. Okullarda görev yapmaya başlayana kadar bu durumun gerçekten bir sorun oluşturacağını düşünememiştim. Şu anda görev yaptığım okulda bilgi işlem birimi olduğu için bu konuda rahatız. Ancak devlet okulunda görev yaparken bu konuda çok sıkıntılar çektim. Halbuki bizler teknik servis olarak görev yapmıyoruz." [65]

" Aldığımız maaş gerçekten çok komik, büyük şehirde öğretmenlik yapıyorum, burda her şey para... bir de mesleğimiz gereği de para harcıyoruz. Dolayısıyla ay sonu nasıl gelcek diye düşünmekteyim hep... hani aslında başka fırsatlarda var belki ilerde değerlendirebilirim bu fırsatları, istifa edebilirim yani..." [66]

"Ben maaşlarımızın artırılmasını istiyorum, zira ek işler yapmak zorunda kalıyorum. Oysa sadece öğretmenlik maaşım bana yetmeli ki daha iyi hizmet verebileyim ben de..." [67]

"...ben Teknik lise mezunu olduğum için seçecek fazla bir tercihim yoktu aslında. Mecbur bilgisayar öğretmenliği olacaktı. Ben de bunların içinden BÖTE'yi seçtim. İlk baslarda çok pişmandım, bölüm çok saçma geldi bana. Ögretmen olduktan sonra daha çok sevmeye basladım. Hem çocukları seviyorum, hem teknolojiyi..." [68]

"Bölümden mezun olunca sadece öğretmenlik yapmak zorunda değilim diye düşünüyordum. Açıkçası özel sektörde çalışıp para kırmayı düşünüyordum. Bu hayal 1. sınıfta da vardı. Fakat daha sonraki senelerde baktım gördüm ki bölümümüzün verdiği eğitimle özel sektörde çalışmak gerçekten hayal. Tabi ki insanın kendini geliştirmesi lazım sadece bölümden beklemek olmaz ama benim ne kendimi geliştiresim kaldı, ne araştırıp bir şey öğrenesim. Sonralari tek hayalim kadrolu olarak öğretmenliğe başlayabilmekti." [69]

"...öğretmen olana kadar yani henüz öğrenciyken rahattım, bölüm çok kolay deyip boş yere çok vakit geçirmişim, fakat daha sonra boş geçirdiğim dört yıla çok yandım. İnanın tembellikten 4 yıl boyunca öğrenmediklerimi şimdi öğrenmeye çalışıyorum. ....yani öğrenciyken sorular sorarsınız ama öğretmenken sorulan soruları cevaplarsınız. Zamanında sorun ki size sorulduğunda da cevap verebilin..." [70]

CURRICULUM VITAE

Personal Information

Surname, Name: Çakır, Recep
Nationality: Turkish (TC)
Date and Place of Birth: 1 February 1974, Samsun
Marital Status: Single
Phone: +90 312 210 36 84
e-mail : rcakir@metu.edu.tr

Education

Degree	Institution	Year of Graduation
PhD	METU Department of Computer Education and Instructional Technology	2008
MS	METU Department of Computer Education and Instructional Technology	2003
BS	Kocaeli University Faculty of Technical Education, Department of Computer Education,	1998

Professional Experiences

Year	Place	Enrollment
2000-	METU Department of Computer Education and Instructional Technology	Research Assistant
1999-2000	Ondokuz Mayis University Department of Computer Education and Instructional Technology	Research Assistant
1998-1999	Ministry of National Education, Samsun	Computer Teacher

Publications

Journal Articles:

1. Cakir, R., & Yildirim, S. (2007). Are Computer Teachers Trained For Teaching Profession: An Assessment of A Computer Teacher Training Program? *Journal of Education & Science,* 31, 35-44.

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