

HOW A COMPUTER EDUCATION TEACHER UTILIZES AN ONLINE
LEARNING ENVIRONMENT

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LEARNING ENVIRONMENT**

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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.

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ABSTRACT

HOW A COMPUTER EDUCATION TEACHER UTILIZES AN ONLINE LEARNING ENVIRONMENT

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The purpose of this study is to examine in detail how a computer education teacher utilizes an online learning environment. The study tries to explore how a computer education teacher uses information technologies in classroom instruction, which methods s/he uses during integration process of the online learning environment, how s/he solves the problems s/he faced and his/her expectations from an online learning environment. Furthermore, based on the experiences of the computer education teacher use of online learning environments by other subject area teachers were pursued.

In this study, within the framework of qualitative research paradigm a case study was conducted in the form of action research. Qualitative research methods were used. A computer education teacher formed the participant of the study with attributes of matching with the purpose and according to predetermined criteria.

Results revealed that the teacher used the online learning environment to support his instruction. Implementation section of the online learning environment was preferred mostly. Use of online learning environment enabled the teacher to spare much time

for dealing with students individually, providing other information source, and increasing students' interest. The teacher utilized the online learning environment for preparing and supporting instruction: Preparing and providing alternative examples, supporting the evaluation process, and assigning homework. Integration of online learning environment is affected by content of lesson, content provided by the environment, and learning materials. The teacher perceived that his students became aware of responsibility of their own learning, become aware of information can be reached from other sources and were much active and participating more to the lessons. The computer teacher perceived that other subject teachers needed technical support, showed lack of access to technology resources, and lack of learning materials to enhance their classroom instruction with technology.

Keywords: Online learning environment, Information technologies in the instructional process, Use of information technologies, Computer education teachers.

ÖZ

BİR BİLGİSAYAR ÖĞRETMENİ ÇEVİRİMİÇİ ÖĞRENME ORTAMINI NASIL KULLANIR

Durdu, Levent

Doktora, Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü

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Bu çalışmanın amacı; bilgisayar öğretmeninin bir çevrimiçi öğrenme ortamını nasıl kullandığını detaylıca incelemektir. Çalışma, bilgisayar öğretmeninin bilişim teknolojilerini sınıf öğretiminde nasıl kullandığını, çevrimiçi öğrenme ortamının öğrenme sürecine entegre edilmesinde hangi yöntemleri izlediğini, karşılaştığı sorunları nasıl çözdüğünü ve bir çevrimiçi öğrenme ortamından beklentilerini açıklamaya çalışmaktadır. Ayrıca, bilgisayar öğretmeninin tecrübelerine dayanarak diğer alan öğretmenlerinin çevrimiçi öğrenme ortamını kullanmaları araştırılmıştır.

Çalışmada, nitel araştırma paradigması çerçevesinde, temel araştırma deseni olarak durum çalışması eylem araştırma desenini içerecek şekilde uygulanmıştır. Nitel araştırma yöntemleri kullanılmıştır. Çalışmanın amacına yönelik ve belirlenmiş bazı kriterleri sağlayan bir bilgisayar öğretmeni çalışmanın örneklemini oluşturmaktadır.

Sonuçlar, bilgisayar öğretmeninin çevrimiçi öğrenme ortamını öğretim sürecini desteklemek için kullandığını ortaya çıkarmıştır. Çevrimiçi öğrenme ortamının en çok uygulama bölümü tercih edilmiştir. Çevrimiçi öğrenme ortamının kullanımı öğretmene, öğrencilerle bireysel olarak ilgilenebilmesi için vakit ayırabilmesine,

başka bilgi kaynağı sunmasına, ve öğrencilerin ilgisini arttırmasına olanak sağlamıştır. Öğretmen çevrimiçi öğrenme ortamını derslerini hazırlamak ve desteklemek için: Alternatif örnekler hazırlayarak ve sunarak, değerlendirme sürecine katkıda bulunarak, ve ödev vererek faydalı hale getirmiştir. Ders içeriği, çevrimiçi öğrenme ortamı tarafından sağlanan ders içeriği, ve öğrenme materyalleri çevrimiçi öğrenme ortamının entegrasyonunu etkilemektedir. Bilgisayar öğretmeni tarafından öğrencilerin kendi öğrenmelerinin sorumluluğunun farkına vardıkları, bilgiye başka kaynaklardan da erişeceklerinin farkına vardıkları, ve daha aktif ve katılımcı olarak algılanmışlardır. Diğer alan öğretmenlerinin öğretimlerini teknoloji ile iyileştirebilmeleri sürecinde teknik desteğe ihtiyaç duyacakları, teknolojik kaynaklara erişimde sıkıntı yaşayacakları ve kullanacak öğrenme materyali bulamayacakları düşünülmektedir.

Anahtar Kelimeler: Çevrimiçi öğrenme ortamı, Öğretim sürecinde bilişim teknolojileri, Bilişim teknolojilerinin kullanılması, Bilgisayar öğretmenleri.

To my beloved wife

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TABLE OF CONTENTS

ABSTRACT	iv
ÖZ	vi
ACKNOWLEDGMENT	ix
TABLE OF CONTENTS	xi
LIST OF TABLES	xv
LIST OF FIGURES	xvi
CHAPTERS	
1. INTRODUCTION.....	1
1.1. Background of the Study.....	1
1.2. Purpose of the Study	8
1.3. Research Questions	9
1.4. Significance of the Study	10
1.5. Definition of Terms.....	14
2. LITERATURE	16
2.1. Educational Technology and Instructional Technology.....	16
2.2. Instructional Technology.....	19
2.2.1. The Domain of Utilization	22
2.3. Computers in Education	24
2.4. Process of Integration of Technology in Turkey.....	29
2.5. Requirements for Effective Use of Technology.....	36
2.5.1. Preservice and Inservice Training.....	38
2.5.2. Access to Technology and Technical Support.....	42
2.5.3. Administrative Support.....	44
2.5.4. Attitudes and Beliefs about Computers and Technology	45
2.6. Related Research Studies	46
2.7. Summary	50
3. METHODOLOGY.....	52

3.1. Purpose of the Study	52
3.2. Design of the Study	53
3.3. Selection of the Participants	58
3.3.1. The Computer Teacher	60
3.4. Research Context.....	61
3.4.1. The Computer Course (Information Technologies Course)	62
3.4.2. The Online Learning Environment	64
3.4.3. Teaching and Learning Strategies of the Computer Teacher	67
3.4.4. The Students and the Computer Laboratory	68
3.5. Researcher Role.....	69
3.6. Data Collection Instruments	70
3.7. Data Collection Procedures	73
3.8. Data Analysis Procedures.....	75
3.9. Validity and Reliability	76
3.10. Limitations	79
4. RESULTS	80
4.1. Implementation of Lessons	80
4.1.1. Results of 4A and 4B	81
4.1.1.1. General Information About the Curriculum of 4A and 4B.....	81
4.1.1.2. Results of 4A – I1 and 4B – I1	82
4.1.1.3. Results of 4A – I2 and 4B – I2	87
4.1.1.4. Results of 4A – I3 and 4B – I3	93
4.1.1.5. Results of 4A – I4 and 4B – I4	96
4.1.2. Results of 6A	99
4.1.2.1. General Information About the Curriculum of 6A	99
4.1.2.2. Results of 6A – I1	100
4.1.2.3. Results of 6A – I2	106
4.1.2.4. Results of 6A – I3	110
4.1.2.5. Results of 6A – I4	113
4.1.3. Results of 6B.....	115
4.1.3.1. General Information About the Curriculum of 6B	115
4.1.3.2. Results of 6B – I1	116
4.1.3.3. Results of 6B – I2	119

4.1.3.4. Results of 6B – I3	121
4.1.3.5. Results of 6B – I4	125
4.1.4. Results of 7A	127
4.1.4.1. General Information About the Curriculum of 7A	127
4.1.4.2. Results of 7A – I1	128
4.1.4.3. Results of 7A – I2	130
4.1.4.4. Results of 7A – I3	134
4.1.5. Results of 7B and 7C	136
4.1.5.1. General Information About the Curriculum of 7B and 7C	136
4.1.5.2. Results of 7B – I1 and 7C – I1	137
4.1.5.3. Results of 7B – I2 and 7C – I2	140
4.1.5.4. Results of 7B – I3 and 7C – I3	142
4.1.6. Overlapping Utilization Patterns	145
4.1.6.1. Enablers of Using the Online Learning Environment	147
4.1.6.2. Methods and Strategies Used During Integration Process	148
4.1.6.3. Related Factors Affecting Integration of the Online Learning Environment.....	149
4.1.6.4. Primary Purposes of Using the Online Learning Environment... 149	
4.1.7. Results of the Teacher’s Perceptions about Online Learning Environments.....	151
4.1.7.1. The Teacher’s Expectations about the Online Learning Environment.....	151
4.1.7.2. The Teacher’s Perceptions about the use of Online Learning Environments by Other Subject Area Teachers.....	153
5. DISCUSSION, CONCLUSION AND IMPLICATIONS	156
5.1. Discussion	156
5.2. How Does the Computer Education Teacher Use and Utilize the Online Learning Environment?.....	158
5.2.1. Which Methods/Strategies Does the Computer Education Teacher Use During the Integration Process of the Online Learning Environment Into the Learning Process?.....	164
5.2.2. What Are the Related Factors Affecting Integration Of Online Learning Environment Into Curriculum?.....	167

5.2.3. According to the Computer Education Teacher, What Are the Primary Purposes Of Using the Online Learning Environment?	170
5.2.4. The Categorization of Teacher’s Usage.....	174
5.3. How Does the Integration Of the Online Learning Environment Affect the Learning Processes According to the Computer Education Teacher?	177
5.3.1. How Does the Computer Education Teacher Perceive the Students’ Progress?.....	178
5.4. What Are the Problems Faced While Using the Online Learning Environment?	179
5.5. What Are the Expectations From an Online Learning Environment?	181
5.6. What Are the Perceptions of the Computer Education Teacher About Integration and Use of Technology and Online Learning Environments by Other Subject Area Teachers?	183
5.6.1. What Are the Required Steps/Processes in Order Other Subject Area Teachers to Use and Integrate Technology and Online Learning Environments Into Their Curriculum?	185
5.7. Conclusion.....	187
5.8. Implications and Suggestions For Practice	189
5.9. Recommendations for Further Research	190
REFERENCES.....	192
A. INTERVIEW GUIDE FOR THE COMPUTER EDUCATION TEACHER ABOUT THE IMPLEMENTATION OF THE LESSON	208
B. INTERVIEW GUIDE FOR THE COMPUTER EDUCATION TEACHER ABOUT USE OF ONLINE LEARNING ENVIRONMENT BY OTHER SUBJECT AREA TEACHERS	211
C. INTERVIEWS CONSENT FORM.....	213
D. INTERVIEW CITATIONS OF THE TEACHER	214
CURRICULUM VITAE	220

LIST OF TABLES

TABLES

Table 2.1: Purposes of Using Computers and the Internet.....	25
Table 2.2: Purposes of Using the Internet.....	28
Table 2.3: Computer and Internet Use Places of People (DPT, 2009)	31
Table 2.4: Purposes of Using Internet (DPT, 2009).....	32
Table 2.5: Training Available for Teachers	41
Table 3.1: Grade Levels, Sections and Students	69
Table 3.2: Interview Schedule.....	74
Table 3.3: Strategies for Validity and Reliability of the Study.....	78
Table 4.1: The Implemented Curriculum of 4A and 4B	82
Table 4.2: The Implemented Curriculum of 6A.....	100
Table 4.3: The Implemented Curriculum of 6B.....	116
Table 4.4: The Implemented Curriculum of 7A.....	128
Table 4.5: The Implemented Curriculum of 7B and 7C	136
Table 4.6: The Teacher's Overlapping Elements of Instruction	146
Table 4.7: The Overlapping Enablers	147
Table 4.8: The Overlapping Strategies Used During Integration Process	148
Table 4.9: The Overlapping Factors Affecting Integration of the OLE.....	149
Table 4.10: The Overlapping Purposes of Using the OLE	150

LIST OF FIGURES

FIGURES

Figure 2.1: The Domains of Instructional Technology	21
Figure 2.2: The Stages of Utilization	24
Figure 2.3: Use of Computers and Internet.....	30
Figure 2.4: Requirements for Effective Use of Technology (OTA, 2005, p. 20)	36
Figure 3.1: Sampling of the Study	60
Figure 3.2: Research Context of the Study	61
Figure 3.3: The Level-step Relationship of the Curriculum	62
Figure 3.4: Information Share Page of the OLE	66
Figure 3.5: Implementation Page of the OLE	66
Figure 3.6: Evaluation Page of the OLE	67
Figure 3.7: The Former Teaching Strategy Adopted by the Teacher	68
Figure 5.1: Elements of the Teacher's Instruction.....	159
Figure 5.2: Activity and Related Actions.....	165
Figure 5.3: Discussions and Related Actions.....	167

CHAPTER 1

INTRODUCTION

The purpose of this study is not only to understand how computer teachers utilize online learning environment but also to investigate possible factors that affect integration process of online learning environment in classroom environments. Therefore, the current study focuses on how the computer education teacher used the online learning environments, what type of methods being used in the integration process by the computer teacher and what type of problems the computer education teacher faced during the integration process. As a result of this study, possible solutions to these problems were revealed in order to integrate technology in an effective way in teaching and learning process.

1.1. Background of the Study

In today's world, being literate about computers is as equivalent as being literate about reading and writing. Being computer literate is a must through a student's education life, professional life and even much more required in social life with the existence of social networks on the Internet. The use of computers in education was pioneered mainly by universities. Today computers have been increasingly used both by teachers and pupils at primary and secondary education. Moreover, computers are aimed to be used not only in computer classes but also in other subject studies computers are tried to be used for variety of purposes such as homework, conducting research, for assistance, demonstration, simulation, examination and etc.

Therefore, equipping schools with computers is presented as success and modernity, and integrating information systems into schools is presented as an effective way of providing solutions to some educational problems. Integration of technology into schools required some definitions and standards to be set for successful implementation. Although, physically placing computers in schools does not guarantee effective use of computers, it is one of the early steps of the entire integration process. For example, within the European Union, Flash 101 project aims to reveal (a) use level and quality of computers for education in schools within EU countries, (b) the Internet connection availability in schools of EU countries (The European Union, 2001). In the USA, similar research reports have been published systematically (NCTAF, 1996; PCAST, 1997; NCES, 2000a, 2000b, 2009). In Turkey, there have been reports about status of society and schools in terms of technology (MoNE, 2002, 2005b; DPT, 2009). Without having a ‘capable’ and available computer and computer-based technologies, a teacher, for example, cannot be able to demonstrate or use a simulation program to present students. Therefore, identifying the current status of schools in information technology is a prerequisite in order to understand the factors affecting technology integration. Actually, this identification is not a ‘identify and leave’ process. In a dialectic way; software developers benefit from the developments in technology such as they are able to develop high quality videos with the developments in graphics hardware. Similarly, software affects technology in a way that high quality software requires high quality hardware. Therefore there is a continuous need for renewing technological equipments including computers (both hardware and software) because capabilities of computers were identified as a barrier for teachers’ using them for instruction. Overall, it is obvious that physically placing computers does not guarantee successful use and integration, but enabling easy access to computers is one of the required actions for integration of technologies in lessons.

As stated, keeping computers up to date, available and accessible in schools (Gülbahar, 2007) are requirements of integration process, but it is obvious that there must be some people using them. Schools have ‘participants’ of students, teachers,

parents, administrative staff and other employee who helps routine tasks to be completed such as cleaning, security, etc. Using computers for administrative purposes is not discussed in detail rather use of computers and computer-based technologies by students and teachers is focused in this study.

This chapter introduced that global economy has been demanding people with highly skilled in using computers and the Internet for various activities and purposes. First of all, anyone to use computers; s/he must know how to use computers. Learning about using computers is achieved via different strategies. Some people learn by professional development, some are self-regulated, and the most learn through formal education. Students in formal education, starting from primary education, have been gaining skills on 'how to use computers'. Officially, pupils at primary schools in Turkey take computer courses that aim to teach how to use computers and software. There are also examples that teach children about computers at kindergarten. Today, pupils learn using computers at very early ages such as three or four. The number of children owning computer with the Internet connection at home has been increasing year by year.

Pupils start using computers mainly for playing games and interact with interface of games mostly. Interestingly, even though they cannot read, they find or discover the meaning of 'start', 'play', 'go' words or buttons or representative images which let them play the game. In other words, today's children start to interact and learn, evenly quicker than many adult, how to use computers at very early ages. Children learn using computers especially application software such as MS-Office® programs, graphics programs, etc. officially with their primary education.

How teachers learn using computers can be approached from two different perspectives. In Turkey, for the last decade most universities provide some courses that aim to teach computers to all students including prospective teachers at Schools of Teacher Education (STE). The computer course(s) provides introductory level information about computers and office programs. The students learn other software such as programming languages, drawing programs, image editing programs, so on

during their undergraduate education. Therefore, subject study of a student is a factor that affects level of computer skills expected and ability to use of specialized software. Prospective teachers are not exceptional. Prospective teachers experience with various software that might help them during their professional life and in their classrooms. However, using computers for personal purposes differs from using them for instructional activities or for some other educational purposes in education.

The Council of Higher Education (CHE) initiated a project parallel to another project of Ministry of National Education and Word Bank. “Evidence also exists that technology will have a stronger impact when technology integration is part of a broader-based reform effort” (Sivin-Kachala & Bialo, 2000, p. 9). CHE, in 1998, reformed the teacher preparation undergraduate programs of STE’s. CHE aimed to have teacher candidates who can effectively use computers not only for personal purposes but also for teaching and learning activities in classrooms. This reform was accepted as a building stone by academicians in terms of integration of technology in schools. Therefore, in many masters’ theses and dissertations, published in Turkey, this reform is explained and described as a change considering the educational system of future. Prospective teachers are expected to use information technologies in their professional teaching.

The process of integration of information and communication technologies into education, and new paradigms of teaching/learning require teachers to change their roles in teaching-learning activities in the instructional environment. To define and describe the new vision of education and schooling teachers are required to progress some qualifications. For example, a study of the European Union (2000) requires the members to identify and form student and teacher performance qualifications in the context of the computer/technology literacy. The European Union (2000) reports ‘Teacher Qualifications’ and described:

- Teacher qualifications in the context of new-defined learning environment,
- Suggestions and solutions to increase teachers’ qualifications.

Another study points out “learning about learning” and “life-long learning” to stress performance criteria for defining teacher qualifications in general and independent of information technologies (The European Union, n.d.). Other official reports also defined and emphasized the importance of information technologies and computer literacy (UNESCO World Educational Forum, 2000), the roles of teachers and students with the integration of new technologies, teachers of the schools of tomorrow (OECD, 2001a), and student and teacher performance criteria for the processes of computer-based education (ISTE, 2008a; OECD, 2001b).

Obviously, process of integrating technology into schools required some definitions and qualifications to be revised. Many authors discussed teachers’ and learners’ roles in respect to contemporary theories. The process of integrating technology into teaching-learning environment affects the nature of teaching and learning, and the relationship between teaching and learning.

The integration of technology into education followed a variable pathway throughout the history of education. Less or more technology has been always around the educational context. Today it is not different from the past; especially the developments in computer technology attracted scholars’ and educators’ attention to concentrate on how to benefit from them. Starting from the early stages of their development, computers have been used in different areas of education for several purposes within several contexts.

So far, the importance of being computer literate in today’s world, the policies and investments made for physically placing computers in schools and the importance of having technology up to date, how students’ and teachers’ learn using computers, change in undergraduate programs of STE’s for preparing future teachers who are expected to effectively integrate information technologies into learning environments, new roles of teachers and students according to contemporary paradigms was explained.

The efforts listed above increased expectations from in-service teachers in favor of using technology in lessons. Teachers are expected to use various technologies to enhance their instruction with the guidance of new paradigms and theories. However, implementation did not meet the expectations. Therefore, many research initiatives started to pursue possible problems, describe problems, and provide solutions.

Possible problem sources have been investigated from different perspectives by different studies. For example, the heading of the dissertation written by Göktaş (2006) is that “The Current Status of Information and Communication Technologies Integration into Schools of Teacher Education and K-12 in Turkey”. The main focus of the dissertation was defined by Göktaş (2006) as:

“to develop a deeper understanding about the integration of ICT into STE and K-12 schools by presenting the current status in terms of ICT perceptions, ICT competencies, ICT usage in classrooms, effectiveness of the ICT related courses, main barriers, and possible enablers to integrating ICT” (p. 3-4).

Göktaş (2006) presents perceptions about various factors related integration of ICT, barriers faced in integrating ICT and possible enablers to the investigated barriers. In another study, Top (2007) focuses on secondary school English teachers’ technology integration. Top (2007) lists the main purposes of the study:

(1) to reveal the instructional technology knowledge of high school English teachers; (2) to investigate how high school English teachers use instructional technology in their courses; (3) to investigate how high school English teachers use technologies to develop professionally; and (4) to develop technology integration guidelines to enable high school English teachers to use instructional technology in their courses. (p. 3)

To sum up, in order to suggest possible solutions to the question: ‘... why don’t they [*teachers*] effectively integrate ICT into their teaching/learning process?’, the researchers pursued possible factors and barriers.

Research studies investigated integration of technology into educational settings by focusing on different perspectives: technological infrastructures of the schools, curriculum of the STE's, teachers' technology skills and perceptions/attitudes about technology and integration of technology into schools. Both teachers and the school administration's perceptions and views about technology integration, barriers to technology integration and of course suggestions to some problems were already investigated to some degree.

Investigating the technology integration process can provide another perspective and a contribution towards more effective integration of technology. Pursuing the process of using of technology in educational setting can help to understand the context, teachers, students and knowledge about teachers' experience. A teacher's experience in such a context can provide information about preferences, strategies and needs in integration process so that possible solutions to the integration problems can be provided. The main aim is to understand a teacher's experiences in the educational context during an integration process.

Investigating a teacher's experiences with an online learning environment thereby exploring factors affecting the process of integration would be a valuable contribution to

- Development of online learning environments,
- Understanding of the processes of technology use,
- Exploring the factors related to technology integration,
- Describing teacher's perceptions about the process

How a teacher does perceive education, use information technologies, prefer various teaching and learning methods, apply different strategies, and experience life is subjective. OTA (2005) states that

"... there is one [no] best way for teachers to use technology—just as there is no one best technology for every teacher to use. Instructional goals, teacher experience, subject matter or

curriculum area, available resources and support, and student needs are all factors that affect teacher's technology use" (p.49)

Although, as stated integration of technology into classroom instruction is affected by subject matter (or curriculum area), understanding how a computer education teacher uses an online learning environment might provide guidelines about the processes of technology integration. In specific, this study aimed to understand how a computer education teacher uses the online learning environment, how the online learning environment affects the learning processes according to computer education teachers, which functions of the online learning environment are identified as both beneficial and useful. Moreover, computer education teachers' expectations and suggestions on new functions for the online learning environment are pursued. Therefore, the factors affecting the process of integration tried to be revealed.

1.2. Purpose of the Study

The aim of this study is to investigate how a computer education teacher utilizes an online learning environment. The study tries to explore how a computer education teacher uses information technologies in classroom instruction, which methods s/he uses during integration process of the online learning environment, how s/he solves the problems s/he faced and his/her expectations from an online learning environment.

Having a close relationship with technology, computers and the Internet, understanding computer education teacher's use of online learning environments will provide a deeper understanding of the processes of technology integration, specifically online learning environments.

To achieve this purpose a computer education teacher was provided an online learning environment that he can use both for classroom instruction and for out-class activities such as homework, information search, practice and etc. The teacher's use and integration process was investigated. Afterwards, the computer education

teacher's perceptions and opinions about integration of online learning environments by other subject area teachers were studied.

1.3. Research Questions

In order to reach the research purpose, four research questions are formed:

(1) How does a computer education teacher use and utilize the online learning environment?

(1.1) Which methods/strategies does a computer education teacher use during the integration process of the online learning environment into the learning process?

(1.2) What are the related factors affecting integration of online learning environment into curriculum?

(1.3) According to a computer education teacher, what are the primary purposes of using an online learning environment?

(2) How does the integration of the online learning environment affect the learning processes according to computer education teacher?

(2.1) How does a computer education teacher perceived his/her students' progress?

(3) What are the problems faced while using the online learning environment?

(4) What are the expectations of computer education teacher from an online learning environment?

(5) What are the perceptions of computer education teacher about integration and the use of technology by other subject area teachers?

(5.1) What are the required steps/processes in order other subject area teachers to use and integrate technology into their curriculum?

1.4. Significance of the Study

The investments made by governments to increase use of computers and the Internet in schools has been explained (Piciano, 1994) and discussed by many authors over the last two decades. A recent paper written by Amiel and Reeves (2008) critically discusses the policies and especially the funds invested by governments in order to encourage use of information technologies in schools. The critical question that can be interpreted from the authors' discussion was that; is it worth of investing such too much money? Indeed, this question hasn't been changed for a very long time. Tickton and Kohn ask the same question "the new instructional technologies: are they worth it?" as early as 1971.

In order to show the amount of money spent by the governments, Amiel and Reeves (2008) also provide detailed information about the funds invested by different countries such as the United States, England and even Brazil as an example of poor country (Amiel and Reeves, 2008). Özdemir and Kılıç (2007) evaluated Phase 1 (1998-2003) of the project between Turkish Ministry of National Education and Word Bank. The authors provide numerical information about investments made and funds used, number of computers, ICT laboratories established, and teachers trained. Özdemir and Kılıç (2007) based on the mistakes of the phase 1, list the actions to be taken for successful visioning, planning and implementation of Phase 2 of the project.

The governmental policies and the investments made by Turkey are mentioned in many theses (Özoğul, 2002; Durdu; 2003) and dissertations (Göktaş, 2006; Top, 2007) including this one, published in Turkey. For example, in his master's theses Durdu (2003) explains the policies made by Turkish Government, starting from

- the project called National Education Development Project (NEDP) by Turkish Ministry of National Education started to establish computer laboratories in 1997-1998,
- the change made by Turkish Council of Higher Education in 1998, in teacher preparation undergraduate programs of faculties of education, and
- to Turkish State Planning Organizations' "Long Term Strategy and 8th Five Year Development Plan 2001-2005".

In accordance with the investments: Today, most of the schools are equipped with several technologies, especially with computers and with Internet connection over the past decade (DPT, 2009). There were many study efforts to pursue about technology and education in order to provide information to knowledge base of the field either supporting or criticizing.

Therefore, there has been an increasing trend in the use of computers in every area of education. “Especially thousands of researches done to prove that the use of computers in learning environments is more effective than books, films, teachers and other traditional methods” (Alessi & Trollip, 2001, p. 5). For example, Liu, Moore, Graham and Lee (2003) stated that most of the researches support the idea that use of computers in learning environment enhances teaching and learning. There are, of course, studies that address the issue from a critical point of perspective. Sandholtz and Reilly (2004) state that “despite many efforts at the national, state, and local levels to promote the use of computers in K-12 classrooms, over the past 20 years, the impact of the computer on teaching and learning has been minimal” (p. 1). Ertmer (2005) states that

“Although the conditions for successful technology integration finally appear to be in place, including ready access to technology, increased training for teachers, and a favorable policy environment, high-level technology use is still surprisingly low” (p. 25).

There were and, obviously, will be various researches that mainly focus on ‘results about, the impact and effect of, perceptions about, measurement of achievement with’ current technologies such as 3G similar to other technologies such as cellular phones, iPods, PDAs and computers (and the Internet) (Ogata, Saito, Paredes, San Martin & Yano, 2008; Milrad & Spikol, 2007). OTA (2005) indentifies the general tendency by stating that "most research about educational technology has focused on the impact of technology on students" (p. 51).

Valuable contributions such aforementioned and possible future research studies are inevitable. On the other hand, a perspective focusing on processes contributes to the understanding of related context of educational setting thereby revealing implementation issues. Salomon, Perkins and Globerson (1991, cited in Bebell, 2003) classify above research examples as *effects of* technology integrated into the classroom and teacher practices (investigating via outcomes testing). The evolution of the learning processes with the introduction of technology is labeled as *effects with* technology.

Young and Ku (2008) from Taiwan state that “core instructional practice is still examination-oriented, and the use of ICT in teaching practice in schools remains marginal” (p. 52). Seels and Richey (2004) underline that “the research base of **implementation** and institutionalization is not as well developed as other areas” (p. 45) and therefore literature that addressing implementation process is little. Furthermore, Bottino and Robotti (2007) emphasize that at primary school level there is need for research to explain phenomenon of integration of technology in the classroom. Finally, Ertmer, Gopalakrishnan, and Ross (2001, cited in Inan, Lowter, Ross, & Strahl, 2010) suggest that “researchers should focus on what teachers are **doing** in terms of beliefs and **practices** regarding computer use in the classrooms” (p. 541).

This research focuses on process of the integration of technology, especially integration of an online learning environment, from the computer education teacher’s perspective. Focusing on implementation process by a computer teacher eliminates

some barriers such as technical knowledge about information and communication technologies, lack of hardware, and technical support thereby strengthen the understanding about integration process.

The aim of this study is to investigate how a computer education teacher utilizes an online learning environment. The study tries to explore how a computer education teacher uses information technologies in classroom instruction, which methods s/he uses during integration process of the online learning environment, how s/he solves the problems s/he faced and her/his expectations from an online learning environment. Moreover, based on the experiences of the computer education teacher, his opinions about use of online learning environments by other subject area teachers are tried to be investigated.

First of all, the knowledge gained from this study may contribute to the literature by explaining how an online learning environment is used and utilized for teaching/learning activities. Examining a computer education teacher's utilization processes through integration of an online learning environment may yield valuable information to understand the strategies developed to achieve desired instructional goal. Therefore, some guidelines and strategies can be drawn about integration of technology and online learning environments for other subject area teachers.

Secondly, the results of this study can be used by Ministry of National Education (MoNE) to examine the existing curriculum of computer course towards more dynamic and interactive curriculum. MoNE may develop and implement an online learning environment (or a portal) for computer education teachers to use and share knowledge, materials, and experiences thereby increasing the use of technology and providing a working example (an exemplary case) to other subject area teachers. Such knowledge management strategy can increase use and integration of technology by other teachers.

Finally, Departments of Computer Education and Instructional Technology (CEIT) can benefit from the results of this study for evaluating their undergraduate

curriculum. Understanding the strategies in the process of integrating online learning environment may help policy makers to examine and revise CEIT undergraduate curriculum towards preparing pre-service teachers for successful integration of online learning environments. Thereby, teacher candidates, not only computer education teachers but also other subject area teacher candidates that attend courses from CEIT department, will be aware of the processes related with the integration and implementation of online learning environment.

1.5. Definition of Terms

Learning gain: The term learning gain is preferred instead of the term acquisition (as used in Baran, 2007). The term 'learning gain' refers to the cognitive process of and result of acquiring skill or knowledge.

Computer education teacher: Or computer teacher is sometimes referred shortly as teacher. Computer education teacher (Becker, 2001) teaches about information technology, information related to computers including hardware and software, history of computer technology, office application programs such as MS-Office, MS-Excel, MS-PowerPoint, and so on. Computer teachers are graduated from Department of Computer Education and Instructional Technology.

Demonstration: "A demonstration is another means whereby pupils can see how certain things are done. A coach demonstrates how to pass a football; a science teacher demonstrates the separation of hydrogen from oxygen by electrolysis, an arithmetic teacher demonstrates a short-cut method for multiplying" (Dale, 1946, p. 42; Dale, 1996, p. 173). The nature of demonstration is twofold. First, demonstration might require the 'watcher' or the 'observer' to do what has been shown. Second, demonstration might require nothing more than observation, but most of the time followed by explanation.

Online Learning Environment (OLE): Is the web-based educational site developed for computer education teachers to use for their curriculum. The site was developed

under the management of Prof. Dr. M. Yaşar Özden (2008a, at CEIT Dept. at METU). The OLE is completely consistent with the elementary education Computer Course instructional curriculum published by MoNE. Worth to note, Mr. Özden was one of the four members of the academic advisory board of the instructional curriculum.

Other subject areas: This study focused on computer education teacher's use and integration processes. Therefore other subject areas cover subjects other than computer education. In other words, science education, elementary education, foreign language education, math education and etc. can be classified under the umbrella of other subject areas. The term subject area is also used by Bebell (2003) to refer subject studies such as math, science, language arts.

Schools of Teacher Education (STE): Stands for Faculties of Education. Göktaş (personnal communications, n.d.) explained that in the USA academicians usually uses/prefers the term 'school of teacher education' or 'school of education' or 'colleges of education' instead of 'faculty of education' and moreover, he told that *they sometimes do not understand me when I write or use the term 'faculty of education'*. Therefore, in this dissertation use of the term Schools of Teacher Education (STE) is preferred instead of Faculties of Education.

Utilization: Seels and Richey (1994) defines utilization as "*the act of using processes and resources for learning*". Those engaged in utilization are responsible for matching learners with specific materials and activities, preparing learners for interacting with the selected materials and activities, providing guidance during engagement, providing for assessment of the results, and incorporating this usage into the continuing procedures of organization" (p. 46).

CHAPTER 2

LITERATURE

In this chapter, the literature related to the research purpose and questions are presented. After providing the definitions of educational technology and instructional technology, the domains of instructional technology is explained, and domain of utilization is focused. Reports and researches are provided under computers in education heading, and process efforts in Turkey are explained, too. The requirements for effective use of technology are discussed with related factors and finally related research studies are presented.

2.1. Educational Technology and Instructional Technology

Educational technology, the field, has struggled in defining itself more than forty years (Luppacini, 2005). As being an evolving field, educational technology is perceived differently by the authors of the field and therefore different nomenclatures has been used (Schiffman, 1991; Alkan, 1998). Professionals in the field use the terms ‘educational technology’ and ‘instructional technology’ has been used as synonyms (Seels & Richey, 1994). Seels & Richey (1994) advocated that “it is difficult to sustain the proposition that ‘Instructional Technology’ and ‘technology in education’ are subsets of ‘Educational Technology’” (p. 5).

On the other hand, some authors reject using the terms interchangeably and blame the professionals for confusing the terms. The following excerpts present the reasoning of authors who claim not using the terms interchangeably:

instructional technology is a sub-set of educational technology, based on the concept that instruction is a sub-set of education (Ely & Plomp, 1996, p. 4).

just as instruction is a subset of education, instructional technology is a subset of educational technology (Molenda & Robinson, 2004b, p. 16).

Molenda and Robinson (2004b) defined the terms ‘education’ and ‘instruction’, where education is being a framework concept for activities and resources that support learning, and instructional implies ‘activities structured by someone other than the learner and oriented toward specific ends’ (p. 1). Therefore, education does not have to be within institutional settings. Gentry (1991) provided an example that educational technology can be a larger technology which might be a combination of instructional technology, learning technology, and managerial technologies.

Molenda and Robinson (2004a) supported the perspective that educational technology is a broader term than instructional technology based on the nature of the relationship between education and instruction where education is more general than instruction. Furthermore, Molenda and Robinson (2004a) interpreted meanings of educational technology and compared the terms. They explained that instruction is more purposive and goals or objectives are determined not by the learner, but by someone else. They also stated that instruction refers to situations where methods and resources are more planned and guided by a person other than the learner. It is worth to note that I agree with the authors who claim that instructional technology is a sub-set of educational technology.

Davies (1996) defined three educational technologies, namely, educational technology one, two and three. Davies (1996) explained that educational technology one is hardware-oriented and aids *for teaching* are important, whereas educational technology two is software-oriented and aids *to learning* are important, and last, educational technology three unites the approaches of the formers. Educational technology three is explained to be a problem solving approach and stresses the teaching-learning environment as well as the processes. A similar notation was used

by Lumsdaine (1996) that is educational technology one stands for ‘hardware for instructional purposes’, and educational technology two stands for ‘technology’ as an application of science. From another point of view, Heinich (1996) classified instructional technology under three functional domains: curricular and instructional design, instructional product design, and media services.

Definition and Terminology Committee of AECT began an initiative to redefine educational technology which can reflect today’s conception. Molenda and Robinson (2004a) provided a current definition of educational technology, which was attributed to be temporary:

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).

This latest definition is said to be built upon the previous definition of AECT’s definition of instructional technology. Molenda and Robinson (2004a) stated that they preferred the concept educational technology instead of instructional technology because education is a broader concept than instruction. This current definition highlighted the concepts; study (rather than research), ethics, facilitating learning and improving performance, use of appropriate technological resources.

Heinich (1991a), radically, stated that “the root of instructional technology is technology itself” (p. 59). Instructional technology can be considered as a subset of technology rather than being a subset of Education (the term used as a discipline not as a general activity). The reason for this is based on the historical background of instructional technology which was evolved from using media for improving teacher performance.

2.2. Instructional Technology

“What is instructional technology? Over the years, many definitions have been offered, but no single definition has been universally accepted” (Reiser, 1987, p. 11). Dr. Finn (1996) identified the audio-visual field as not being a profession yet, in his original paper published in 1953. To note, Dr. Finn was one of the pioneers who provided valuable contributions towards foundation of the field instructional technology (Molenda, 2003; AECT, 1977, cited in Seels & Richey, 1994). Ten years after Finn’s identification, the field revised definitions and listed the roles and/or functions associated with the field.

The first definition is known as AECT’s 1963 definition because it initiated changing the name ‘Department of Audiovisual Instruction’ to ‘Association for Educational Communications and Technology’. According to Ely (1963, cited in Seels & Richey, 1994), the definition lists the roles or functions to focus on process rather than product. Another distinction included in the definition was the use of the term ‘efficient utilization’.

Commission on Instructional Technology (1970) provided two definitions of IT to provide two perspectives. The first definition focused on the media (medium or device), and the second way of describing IT focused on process of learning and teaching for effective instruction. The second definition is mostly known as ‘systems approach’.

The third definition emphasized “the individual learner and his unique needs” and “use of systematic approach” (p. 36). At the same year another definition was provided by Silber. Silber’s definition was different from previous one, in terms of using ‘development’ to mean producing, using and evaluating technology, and stressing ‘solving educational problems’ (Seels & Richey, 1994).

Two years later, another definition was stated by for Educational Communications and Technology (AECT, 1972). The most important outcome of the definition was to

attempt towards identification of educational technology as a field. The definition's focus was development and utilization of learning resources, in the most refined form. AECT provided another definition in 1977. In this definition, AECT identified theory, field, and profession. Reiser (1987) stated that 1977 definition was broader than formers, and tried to vision of the field.

In 1994, seventeen years after the former definition, instructional technology was defined as “the theory and practice of [*the five domains:*] design, development, utilization, management and evaluation of processes and resources for learning [*italics added*]” (Seels & Richey, 1994, p. 1). Although, it was not stated explicitly, the definition gave importance to both processes and product. A current definition provided by Molenda and Robinson (2004a) was explained in the previous heading.

Seels and Richey (1994) listed areas that are related with instructional technology as domains of the field. The five domains of the field are design, development, utilization, management, and evaluation. Seels (2005) stated that in order to clearly and fully provide a ‘definition’, the relationships emerged from the theory and practice need to be defined and organized through written statements and visual representations. Figure 2.1 (re-drew based on the original work of Seels & Richey, 1994, p. 27) shows the 1994 definition visually via providing the domains of the field and their relationships with each other.

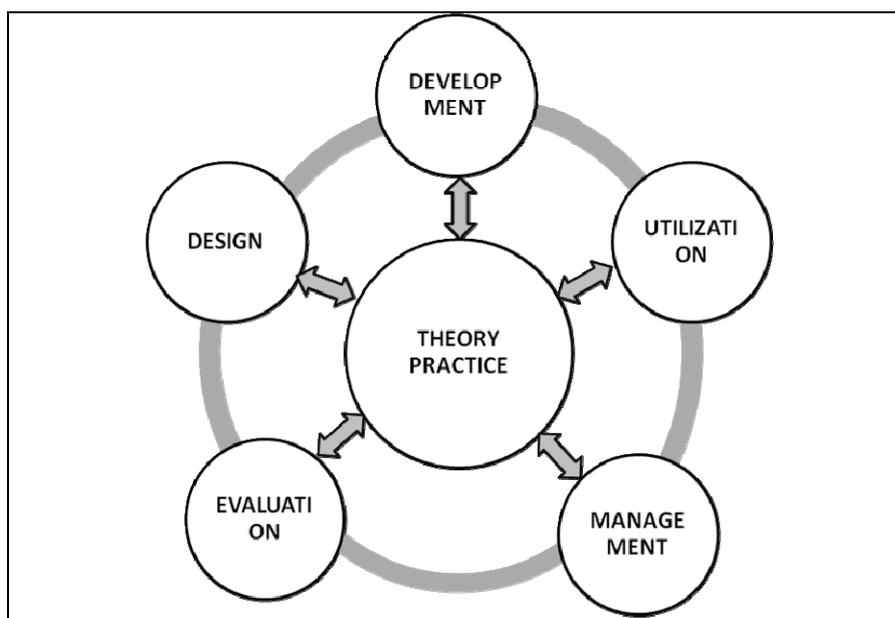


Figure 2.1: The Domains of Instructional Technology

To explain the domains briefly, the domain of design covers theory- and practice-oriented major areas of instructional systems design, message design, instructional strategies, and learner characteristics. The domain of design is mainly rooted around instructional systems design (ISD) and has a trend towards situated learning, performance technology, and systemic design issues. The roots of development domain are coming from media production. Development, in general sense, covers the process of using design specifications towards the production of materials. Therefore, development encompasses print, audiovisual, computer-based, and integrated technologies. The domain of utilization focuses use of processes and resources for learning. Project, resource, delivery system, and information management are the four components of the domain of management. Last, evaluation concerns with problem analysis, criterion-referenced measurement, formative evaluation, and summative evaluation. The domain of utilization is explained in detail in the next section, as being very close to the aim of this study.

2.2.1. The Domain of Utilization

Any definition of educational technology would be incomplete without explicit acknowledgement that ‘using...appropriate technological processes and resources’ is the end purpose for which the field exists (Molenda, 2005, p. 1).

The term ‘using’ covers activities (i) a teacher (or a learner) to select and use one specific bit of material, or (ii) a training strategy adopted by an entire organization, all can be a classroom instruction or an online delivery (Molenda, 2005).

Based on the use of materials, utilization has its roots from the use of audiovisual materials (Seels & Richey, 1994; Molenda, 2005). The work of Dale (1946) significantly affected the wide spread use of learning materials. The utilization domain, therefore, mostly associated with the concept of learning materials and processes for their use. For example, Ely and Plomp (1996) provided educational/instructional technology functions and explained that a function which focuses on utilization purpose should “bring learners into contact with Learning Resources and Instructional System Components” (p. 10). The examples for such purposes are to “help students use learning activity, monitor individualized and self-instruction, and help students select learning activities and to meet objectives” (p. 10).

Molenda and Robinson (2004a) provided the definition of educational technology, in today’s conception, and explained the elements of the definition and the word ‘using’ was used in this contemporary definition. According to Molenda and Robinson (2004a) ‘using’ can be explained by the framework and interaction of the theories and practices of environments in which learners experience learning conditions and resources. To detail the meaning of the word ‘using’, Molenda and Robinson (2004a, 2004b) explained that

“the learners encounter with the learning resources takes place within some environment following some procedures, often under

the guidance of an instructor, the planning and conduct of which can fit under the label *utilization*” (p. 6).

To note that, the 2004 definition preferred the term ‘using’ and the 1994 definition found it more appropriate to use the word ‘utilization’. Seels and Richey (1994) defined utilization, in the most broad sense, as “the act of using processes and resources for learning” (p. 46). The domain of utilization is defined in two perspectives in the definitions of the field. The first and most commonly implied meaning of the term refers interacting learners with appropriate learning materials. The second meaning associated with utilization is diffusion. Molenda and Robinson (2004a, 2004b) stated that diffusion process as another phase of using. They intentionally used the word ‘phase’ because diffusion requires utilization to be achieved as a first phase. To make it more understandable, Molenda and Robinson (2004a, 2004b) introduced the terms integration which is teachers’ inclusion of resources, and institutionalization which is the integration occurring on a large scale.

Seels and Richey (1994) provided subcategories of utilization, which I attribute more comprehensible for explaining the concept and therefore preferred to present. *Media utilization, diffusions of innovations, implementation and institutionalization, and policies and regulations* are the sub-components of the domain of utilization. Media utilization requires using resources for learning systematically. It is decision-based oriented. Diffusion of Innovations aims to achieve change. This subcategory, as the name implies influenced from the publication of Rogers (1983) titled ‘Diffusion of Innovations’. The next subcategory identifies two interrelated concepts: Implementation and institutionalization. Implementation is described as “using instructional materials or strategies in real (not simulated) settings. Institutionalization is the continuing routine use of the instructional innovation in the structure and culture of an organization” (Seels & Richey, 1994, p. 47). The last subcategory is policies and regulations concentrates on rules and actions. Policies and regulations are attributed to be the most affecting factor for utilization and they affect practice more than theory.

Molenda (1993, cited in Seels & Richey, 1994) proposed that utilization has three stages: usage, installation, and institutionalization which are shown in Figure 2.2 as consecutive phases. Usage as being the simplest stage occurs when an instructional material or technique is used one-time either as planned or spontaneously. Installation comes to fruition when (i) the material or technique being embedded in a larger package or an instructional system, (ii) or the material or technique is used continuously implemented as a part of curriculum of an organization. Last, (iii) institutionalization intentionally and consciously embeds the instructional innovation (material, technique, or system) into the structure and culture of an organization (Seels & Richey, 1994).

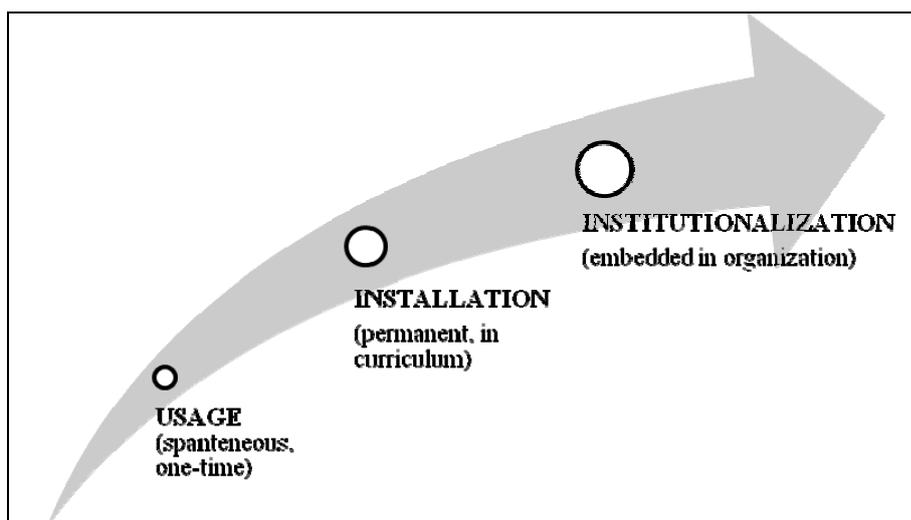


Figure 2.2: The Stages of Utilization

2.3. Computers in Education

Not only in developed and wealthy countries, but also in developing nations number of computers rapidly increases. There are two ways of using computers in education;

using for administrative purposes (and routine tasks of classroom management) and using for instruction (Cairncross & Pöysti, n.d.).

It was Ely’s (1991) visioning that in the United States there will be computers in every public school which has come to be true today. However, Shi and Bichelmeyer (2007) stated that there have been many research studies that showed the integration of computers in schools failed present satisfactory results. They questioned teachers’ underuse of computers, money spent on computers and Internet connectivity, and progress of teachers and students in the educational settings.

The report of National Center for Education Statistics, NCES (2000a) provides answers to or possible causes of some questions of Shi and Bichelmeyer. Thirty-nine percent of teachers stated that they create instructional materials with computers and the Internet. The percentage of teachers using computers for administrative purposes was 34%. Using computers for accessing model lesson plans or to access research and best practices was reported by 10% of teachers. Newer teachers use computers or the Internet more than elder ones. On the other hand, Hsu, Wu and Hwang (2007) found that novice teachers failed to user computers and the Internet effectively although novice teacher (for being younger) show positive attitudes towards computers which is often stated as indicator of using computers in classroom. Table 2.1 presents the use purposes of computers and the Internet. Teachers more than 20 years of experience reported with less percentage to the items “communicate with colleagues”, “gather information for lessons”, and “create instructional materials”.

Table 2.1: Purposes of Using Computers and the Internet

	3 or fewer years	4 to 9 years	20 or more years
Communicate with colleagues	30%	30%	19%
Gather information for lessons	21%	22%	11%
Create instructional materials	-	47%	35%

NCES (2000a) report provided information about “how do teachers direct their students to use computers and the Internet” (p. 2). Majority of teachers reported that they used computers and the Internet for instruction during a lesson. The percentage of teachers who reported that they assigned work related to computer applications such as word processing or spreadsheets was 41%. Practice and drill studies were assigned by 31% of the teachers. On the other hand when the teachers were asked to state how well prepared they feel to use computers and the Internet. 23% of teachers reported feeling well prepared and 10% very well prepared. Moreover, younger teachers felt better prepared and teachers with professional development about using computers and the Internet felt very well prepared. Teachers who didn’t attend any professional development felt not at all prepared.

Another report of NCES (2000b) extended the findings of the previous work. NCES (2000b) presented that the percentage of use of computers increased. It was reported that in 1992 thirty-five percent of teachers reported using computers for writing drafts, in 1998 the percentage was 63%. The teachers’ statements about using computers to practice spellings, punctuation, and writing (15% in 1992 and 32% in 1998) were parallel to former results. Another data set provided NCES (2000b) to report that teachers 78% of teachers created instructional materials, and 59% of them gathered information for planning lessons by using computers and the Internet. However, when the data set investigated in-depth it could be seen that 39 percent reported using computers for creating instructional materials as ‘a lot’ and the remaining 39 percent ‘a little’. Their total was represented as 78% of teachers used computers for creating instructional materials. Interestingly, teachers reported that they used computers at home more than at school for creating instructional materials, accessing best practice examples and model lesson plans, and gathering information for lesson plans. Naturally, their use at school was higher for administrative record keeping and multimedia presentation. Number of students, being a primary or secondary school teacher, minority enrollment with poverty, and teaching experience were the factors affecting teachers use of computers and the Internet at home or at work.

The percentage of teachers reporting use of computer-based technologies in class time was 53%. Elementary teachers preferred in class use more than primary teachers. The lower the number students in schools the more teachers used of computer-based technologies in class (56% for lower and 40% for large enrollments). When instructional activities are concerned; word processor or spreadsheets were used 61%, Internet research 51%, practice drills 50%, solve problems and analyze data 50%, CD-ROM research 48%, multimedia projects 45%, graphical representation 43%, demonstration and simulation 39%, and communication with experts 23% (p.24, NCES, 2000b). It is worth to note that the responses of teachers include answers 'small extend', 'moderate extend', and 'large extend'. Moreover, 'small extend' answers constituted high portion of the provided percentages. For example, use of word processor or spreadsheets represented in total 61% as presented above. The distribution of answers were 'small extend' constituted 20%, 'moderate extend' constituted 21%, and 'large extend' constituted 20% of the total percentage (NCES, 2000b, p. 25).

Another NCES (2006) survey showed that by 2005, nearly all (95%) of public schools was connected to the Internet. The percentage was 77 in 2000, and it was 3% in 1994. Schools with Internet connection have broadband connections (97%). The percentage of schools with wireless connection was 45%. The ratio of students to instructional computers was 3.8 to 1. NCES (2006) reported information about professional development efforts. The percentage of schools, of which with the Internet connection, offered professional development about how to integrate use of the Internet in curriculum was 83%. The attendance rate was 1 to 25 percent to such trainings. The NCES (2006) report provided information about purposes of using the Internet is presented in Table 2.2.

Table 2.2: Purposes of Using the Internet

	Percentage
To provide data to inform instructional planning at school level	89%
Provide assessment results and data for teachers to individualize instruction	87%
Providing high quality digital content	87%
Online professional development courses to teachers	51%
Providing access for students to online distance learning for courses that are otherwise unavailable at school	32%

When compared to 2006 report which classified internet connection types as broadband or narrowband, 2009 report of NCES detailed the types of the Internet connection. Furthermore, NCES (2009) reported a summary of availability and use of informational technologies and related devices, computer software, and leadership and staff support for educational technologies for 1600 public school districts in the 50 states. The findings showed that 97% of districts had a local area network and all of them were connected to the Internet via district network. Connection types from schools to districts were fiber (55%) and T1 (26%), from districts to Internet Service Provider(s) were T1 (42%), direct fiber (37%), wireless (18%), broadband cable (13%), and T3 (12%). Most of the districts had formal computer replacement plan. 37% of them had plans for replacing all computers and 22% considered changing some computers, and other provided an upgrade plan. It was reported that 72 percent of elementary schools provided access to library catalogue, and it is 82 percentages for secondary schools.

It might be questioned that at which grade levels use of computers can be used effectively. According to the Roblyer's (1989) study, effectiveness of computer based instruction is significant at all grades levels, however, findings cannot be used in favor of any particular level. To the students' point of view, Ađır, Sütçü and Sarı (2001) found some interesting results in their study which was about elementary

students' views of education over the Internet. They presented that 75% of the students see internet as a school and 32% of the students see internet as a library. Today's children know the value of technology, and they use it in every area of their life. Moreover, they are aware of the potential of computers in their education. As it can be seen from the result of Ađır et al., most of the students see internet as an information source. Ađır et al. (2001) study investigated students' opinions about the courses that they are taking can be learned over the Internet or not. Some interesting conclusions were drawn from their study such as 80% of the students thought that "Social Science" course can be learned from the internet, their second choice was "Science" course with 75% and their third choice was "Computer" course and their fourth choice was "English" course with 70%. Ađır et al. also investigated students' attitudes towards internet. 52% of the students think that they want to learn English from internet. Ađır et al. focused on the question whether replacing classroom environment with internet environment or not. However, the Internet environment can be more effective when used as supplementary to the classroom environment.

2.4. Process of Integration of Technology in Turkey

Our world now already opened a period which is called as digital age. Like the industry revolution, countries are trying to catch and utilize amazing technological developments into every area of their technical and social life. Tremendous developments in technical areas directed governments to benefit from its advantages by starting several projects to integrate different uses of technology in social life. In order to facilitate and to speed up the production, procedures of bureaucracy, and etc. different kinds of technological developments were used. When concentrated on the social life, computers are mainly used, for the past decade especially internet has been the most popular tool that plays a great role in our routine works. The term electronic is now used in our daily life communications. E-mail, e-government, e-university, e-lesson, and etc. are the terms that are not strange to hear in social communications.

There are policies, investments, strategies and projects for fastening the process required towards an information society. For example, DPT (2009) cooperated with researchers and collected systematic data about the status of technologies in Turkey. To DPT (2009) report, percentage of using computers and the Internet, the change in the computer and the Internet use places of people, and purposes of using such technologies can be investigated. The data can help to see the general situation in Turkey because the data were collected from a significant number of people. For example, in 2004 the data collected from 9.571 people, in 2005 the sample was 10.151, in 2008 there were 5.321 people participated to the study. Participants of the study aged from 16 to 74.

The results show that there had been an increase in the use of computers and internet from 2004 to 2008 as it shown in Figure 2.3. The developments in computer technology and the relative decrease in prices enabled most people to buy computers and connect to the Internet.

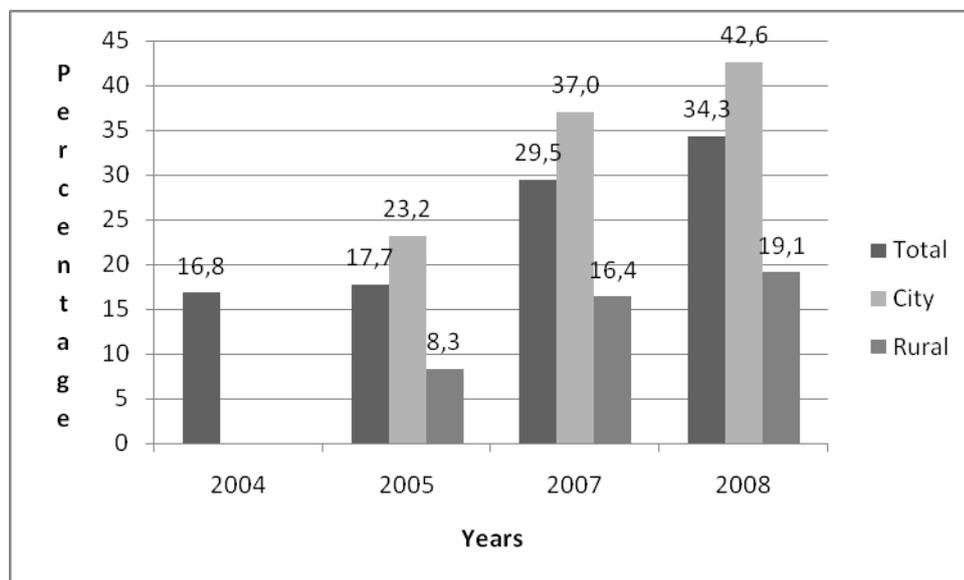


Figure 2.3: Use of Computers and Internet

DPT (2009) report also provided information about the computer and the Internet use places of people as presented in Table 2.3. There had been a continuous increase in the use of Internet at home as parallel with the use of computers and the Internet results. There had been very little decrease in using computers and the Internet at work and Internet Cafés. The striking point is the stability of internet use at schools. The use of computers and the Internet remains to be between 7% - 11% and 6.9% - 8.9% correspondingly. The reason of this situation seems to be the target of the research interest. The research participants were older than 16 indicates that possible participants of the study were graduated from primary schools, however they would be still high school students. Therefore, it is interesting the there hadn't been any change about use of computers and the Internet at schools.

Table 2.3: Computer and Internet Use Places of People (DPT, 2009)

	2004		2005		2007		2008	
	Computer %	Internet %	Computer %	Internet %	Computer %	Internet %	Computer %	Internet %
Home	37.4	32.3	-	27.6	53.5	46.0	61.6	55.2
Work	43.9	41.1	-	43.3	36.3	37.5	37.6	38.4
Education	11.3	8.9	-	8.8	7.1	6.9	8.8	8.9
Internet Café	33.0	41.2	-	36.6	26.6	31.2	21.8	24.2
Friendes, families, etc.	10.8	11.8	-	7.2	11.5	13.1	12.9	15.9
Other	0.9	0.7	-	1.5	2.7	1.7	2.3	3.0

DPT (2009) report presents another perspective about use of the Internet: purposes of internet use of 2008 data as shown in Table 2.4. The internet was mainly used as reaching information, communication, and enjoy. The responses to the item “Using internet for learning purposes”, which was a general term, was high. On the other

hand, “participating to an educational training in any subject (foreign language, computer, etc.)” was ranked 21th among 28 items.

Table 2.4: Purposes of Using Internet (DPT, 2009)

	Turkey	City	Rural
Reading newspapers or magazines	76.0	76.9	72.1
Sending and receiving e-mails	74.0	75.1	69.4
Instant messaging (chat, msn, skype, realtime communication)	69.7	69.1	72.1
Download or listen music (except online radios)	65.2	64.7	67.6
Video conferencing over the Internet (via webcam)	45.5	46.0	43.5
Research about health	45.1	46.3	35.8
Find information about goods and services	43.9	45.7	35.8
Using internet for learning purposes	31.0	31.0	30.9
Search information about training programs about school, university or professional	25.5	25.5	25.5
Participating to an educational training in any subject	8.0	8.3	6.9

The efforts of increasing the use of technologies towards an information society, there had been other initiatives to benefit from computers. As stated in the No Child Left Behind report “education is one of the most important functions of government” (NCLB, 2004). Remembering their most important function, governments started to benefit from technological developments also in educational settings. Computers had been used in five major areas which are educational research, educational service management, measurement and evaluation, counseling services, computer education and teaching learning activities such as computer aided instruction (İmer, 2000). Further, use of technologies especially computer technology and internet in educational settings became countries’ governmental politics.

Turkey also followed these technological developments and made necessary investments required for effective uses of technologies in social context. Göktaş (2006) traced information and communication technology, ICT, related initiatives to 1984. Top (2007) traced the initiatives as early as 1962 from use of educational technology perspective. Imer (2000) also mentioned projects about developing educational software with the cooperation of MoNE, universities and TÜBİTAK. The revolutionary project was initiated with MoNE and WordBank, major aim of the program was to integrate ICT into education and phase 1 of the project was started in 1998 and completed in 2003 (Özdemir & Kılıç, 2007). Another initiative parallel to the project was the foundation of EğİTek (General Directorate of Educational Technologies) in 1998. Eğİtek (n.d.) aims to produce various kinds of learning materials for educational settings.

In order to use the computers in schools, first, infrastructure of the schools must be established. Turkish Ministry of National Education initiated a project called Developing National Education Project to establish computer laboratories in 1997 with the support of the World Bank. Turkish Ministry of National Education established and continues to establish computer laboratories in public schools for increasing the use of new technologies in educational settings. All these investments were made to increase the use of new technologies in educational settings. Özdemir and Kılıç (2007) summarized that during the first phase of the project “3.188 ICT classrooms established in 2002 primary schools, 56.605 computers installed in 26.244 rural primary schools and 25.000 teachers trained in computer literacy and 15.928 more trained by the equipment suppliers” (p. 913).

Keskinkılıç (2004) reported another initiative of MoNE project to connecting schools (approximately 22.500) to the broadband Internet. Today, a recent report of DPT (2009) indicated that 94% of students in primary schools and all of the elementary students have fast internet connections. On the other hand, the report revealed that some indicators were not identified. For example, the number of computers available for students to use, the number of computers available for teachers to use, the

number of information technologies laboratories, number of classrooms that have information technology equipments, and teachers ability and skills about information and communication technologies. MoNE (2005b) evaluated the past studies and projects and aimed to achieve new objectives for integration of information and communication technologies into the educational system. Except for the infrastructural objectives, MoNE (2005b, p. 32) listed that

In-service training will be provided for teachers, students, administrators, and other school staff to use ICT and benefit from ICT in processes of education.

Curriculums of studies will be modified to be more student-centered and students will be enabled to reach information sources by using ICT individually during learning processes.

Educational settings will be provided that enables creating of and use of high quality digital content. There will be initiatives to organize digital content so that it provides a learning environment for students to learn by themselves.

There was not only a need for training of in-service teachers, but also the teachers of future were required be computer literate and able to use technology and integrate ICT into their curriculum. It is obvious that prospective teachers must be trained about ICT and beginning with prospective teachers should be the first steps of diffusing integration of technology in schools (Wright & Wilson, 2005). Yıldırım (1999; 2000) pointed out that schools of teacher education are responsible for providing high quality competency levels about computers and use of computers in order to increase teachers' use of computers in schools. Similar studies also stress that teachers must be familiar with computers, have positive attitudes towards computers, be comfortable with the technology and be able to use it effectively. ICT is a possible enabler of preparation of appropriate learning environments for the learners. Therefore, teacher candidates in universities and employed teachers have to be aware of the new technologies and abilities to use them (Akpınar, 1999). When teachers are familiar with the different uses of technology it is much possible that

they are going to use technology in education. Moreover, in their pre-service education, the more they use computers and different kind of computer applications, the more they will have positive attitudes towards computers.

Another project for supporting and increase the use of computer technologies in educational settings was initiated. Turkish Council of Higher Education-CHE-, (1998) reformed teacher preparation undergraduate programs of schools of teacher education via adding some courses into curriculum to extend the usage of information technologies in the schools and to teach how to develop the various kinds of instructional materials for enhancing classroom instruction. With this reform it was aimed that teacher candidates will be familiar with and know how to use different kinds of technologies such as computer, internet, multimedia, television, video, projector, etc. in their classrooms. Thus, teachers of the future will become familiar with the new technology, and they will use several kinds of technologies in their teaching-learning environment more effectively and productively. Therefore, for teachers to be computer literate in all departments in the schools of teacher education in Turkey started to offer two technology training courses, as a must course, starting from 1998-1999 academic year. These courses are ‘Computer Applications in Education’ and ‘Instructional Technologies and Material Preparation’.

In the ‘Long Term Strategy and 8th Five Year Development Plan 2001-2005’ of Turkish State Planning Organization (2001), use of new technologies in all areas of education, but especially in primary education was strongly expressed as

“Satisfactory developments in utilization and extension of new technologies in education could not have been ensured. Initiating computerized education at all levels of education with a special emphasis on primary education, providing internet access for every school and producing curriculums as software programs bear great importance.” (p. 88)

Turkish State Planning Organization continued to stress the importance of the usage of computers in all levels of education by stating;

“Technological facilities, particularly computer technology shall be utilized at the utmost level; open university education and new educational methods using high technology shall be put into practice at all levels of education.” (p. 89)

As it can be seen from the report of Turkish State Planning Organization, especially in primary education use of computers is a governmental politics. Moreover, it is one of the required strategies in adaptation for European Union.

2.5. Requirements for Effective Use of Technology

The previous heading explained the technology integration initiatives and projects in Turkey. This heading focuses on the requirements (OTA, 2005) and/or essential conditions (ISTE, 2008b) that enable and help for successful integration of technology. OTA (2005) provides the requirements for effective use of technology as presented in Figure 2.4.

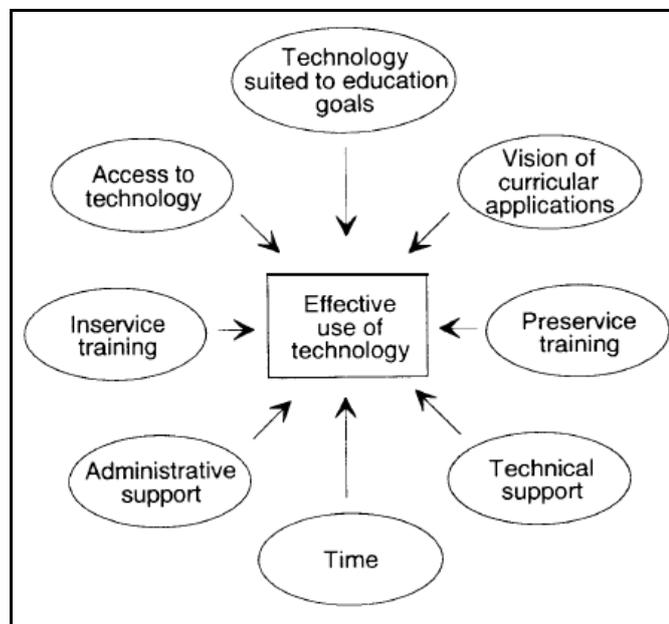


Figure 2.4: Requirements for Effective Use of Technology (OTA, 2005, p. 20)

The factors related with teachers' use of information and communication technologies have been addressed by many researchers. Based on an extensive literature review, Mumtaz (2000) presented a general classification of areas that are related to teachers' use of ICT:

- factors that discourage teachers from using technology;
- schools as organisations;
- factors that encourage teachers to use technology;
- the role of the teacher in relation to ICT and its effect on pedagogy;
- teachers learning to integrate technology into their teaching (p. 319).

From another point of view Papanastasiou and Angeli (2008) examined the factors that affect teachers' effort to teach with technology. They listed that "(a) teachers' knowledge of technology tools, (b) teachers' frequency of using technology for personal purposes, (c) teachers' frequency of using technology for instructional purposes in different content areas, (d) teachers' attitudes toward technology, (e) teachers' self-confidence in using technology in teaching and learning, and (f) school climate" (p. 70). Oncu, Delialioglu and Brown (2008) investigated how teachers decide what technologies to use and teachers' expectations from adopting technology. They determined five criteria that affect teachers' decision: (1) accessibility and availability, (2) applicability, (3) influence of colleagues, (4) teachers' skills/knowledge, and (5) students' skills/knowledge (p. 19).

There are also some other requirements for successful integration of computer technologies into classrooms. Based on barriers lists of Göktaş (2006) and NCEs, 2000b) and Çağıltay, Çakıroğlu, Çağıltay, and Çakıroğlu (2001), Mumtaz (2000), and Ertmer (1999) removing the some barriers listed below can increase teachers' use of technologies in lessons:

- Lack of insufficient training
- Lack of teaching experience
- Lack of technology availability and access to technology
- Lack of technical support

- Lack of administrators' support
- Lack of good instructional software
- Lack of time in schedule
- Lack of time for integrating ICT into classroom
- Lack of financial support

Ertmer (1999) categorized the barriers into two as intrinsic and extrinsic. Extrinsic barriers include access to technology (computers and the Internet) and software, technical support, and administrative and peer support. Intrinsic barriers are identified to be personal beliefs, previous success with technology, and self efficacy.

There have been some studies which discussed factors from the perspective of diffusion of instructional technology, i.e. not only focusing on the teachers, but also focusing institutional factor related to adoption of technology. For example, Garland (1991) listed the factors as people issues (resistance to change, support of adoption), cost (not only refers to money, but also time issues), and infrastructure (availability and access to resources). The suggestions of Garland are important to move from stage of usage to institutionalization. Mumtaz (2000) also addresses this issue with the section 'schools as organizations' in the scope of the classification areas of ICT use.

2.5.1. Preservice and Inservice Training

Byrom (1998) stated "access to technology is one thing: use is another" (p. 1). Therefore, having the required and appropriate technological infrastructure and equipments doesn't guarantee successful use of them. A teacher's competence about using computers is one of the most important factors for integration of technology into learning environments and processes (Altun, 2003; Becker, 2001; Becker, Ravitz & Wong, 1999). OTA (1995) reported that "most teachers have not had adequate training to prepare them to use technology effectively in teaching" (p. 2). In order to instructional technology to play a major role in schools, pre-service teachers should

be taught about new technologies and the processes of integration (Reiser & Salisbury, 1991) and in-service teachers should be provided continuous trainings (Çağiltay, Çakıroğlu, Çağiltay, & Çakıroğlu, 2001). Göktaş (2006) statistically showed that taking ICT related course significantly affect perceived ICT competencies.

Training of teachers is approached from two perspectives. First, teachers need to be trained about technology for increasing their competency on technology. Second, teachers need to be trained about how to use technology in their lessons. Algozzine, Bateman, Flowers, Gretes, Hughes and Lambert (1999) classified these two types of trainings as basic and advanced competencies respectively. The two competencies should be provided via trainings and should be a requirement for both pre-service teachers (Hsu, Wu and Hwang, 2007) and in-service teachers (Göktaş, 2006).

Becker (1999) found that young teachers, with less than four years experience, were using the Internet with students less than other teachers although young teachers are expected to be more skilled in computer based technologies. Another study, Hsu, Wu and Hwang (2007) showed that younger people and novice teachers (as they are younger) have positive attitudes towards computers. However, novice teachers didn't able to use computer technology in their classroom instruction as higher as their attitude level. The authors explained the possible reason: although novice teachers had experience with computers they didn't have any experience with integration of computers into instruction and "they had not been exposed to regular applications of CBT in instruction by their teachers" (p.243). They criticized that teacher education programs give more importance for using computer based technologies (CBT) than teaching with CBT. Therefore, novice teachers lack of knowledge about using CBT for instructional purposes. Therefore, teaching programs should focus more on teaching with technology than teaching the technology.

Teacher preparation programs have been criticized by some others official reports (NCES, 2000b; President's Committee of Advisors on Science and Technology, 1997; National Commission on Teaching and America's Future [NCTAF], 1996).

President's Committee of Advisors on Science and Technology (1997) identified that "pre-service requirements, however, can typically be satisfied by completing a course on how to operate a computer, or by a 'methods' course in which educational technology is discussed, but never actually used by either the professor or the students" (pp. 53-54).

Göktaş (2006) made a detailed recommendation about pre-service requirements and stated that information and communication technologies related courses should provide prospective teachers the skills and knowledge, and experience of teaching with technology. Proposing a suggestion to be implemented in Turkey, "a third ICT related course which includes integration of ICT into the field of studies (i.e. math, language, and chemistry)" (Göktaş, 2006, p. 172) was an impressive suggestion.

Strudler, Mckinney, Jones and Quinn (1999) investigated first-year teachers teaching experiences in teaching via use of technology. They found that junior teachers were not capable of teaching with technology because they were not prepared during their teacher preparation program. The authors recommend teacher preparation programs to enhance their pre-service courses and provide field experiences. However, this could be because that beginner teachers are being an inexperienced teacher struggles to accept their role as teacher (Novak & Knowles, 1991). Beginning teachers are inexperienced with the issues of classroom management, teacher-student interactions, timing of the lessons, and some other issues. Therefore investigating beginner teachers may yield misleading results. The two reports of The National Commission on Teaching & America's Future (1996, 1997), indeed, identified the existing problem about beginning teachers and it is suggested that preparation programs should be extended so that they can provide a yearlong internship. The reports also suggested professional development efforts should be embedded in teachers' daily work.

Actions towards Teacher Training

NCES (2000b) provided sources of training which prepared teachers to use computers and the Internet. Interestingly, 93% of stated independent learning, 88% stated professional development activities, and 87% stated colleagues. Younger teachers stated ‘colleagues’ more than older teachers. 84% of the young teachers stated they were prepared by colleagues, whereas the percentage was 44 for teachers with experience of 10 to 19 years, and 31% for those teachers with 20 years and more teaching experience.

NCES (2000b) reports teachers’ professional development experiences. The teachers indicated that training about use of computers/basic computer training as most available training (96%). Available training about software applications was 88%, about use of the Internet (87%) and integration of technology into curriculum and classroom instruction was 79 percent. Moreover, the participation to professional development training also presented in Table 2.5. As the table presents the participation rate was lower than expected. NCES (2000b) reported the cause of low participation rate that in-service teachers complained about that they didn’t have any release time for attending to a training program or learning how to use computers and the Internet.

Table 2.5: Training Available for Teachers

	Availability of training	Participation to training
Training about use of computers/basic computer	96%	83%
Training about software applications	88%	81%
Training about use of the Internet	87%	75%
Training about integration of technology into the curriculum/classroom instruction	79%	74%
Follow-up and/or advanced training	67%	55%
Training about use of other advanced telecommunications	54%	53%

According to CNES (2009) report, districts provided professional development in integrating technology (95%), using Internet resources and communication tools (91%), and Internet safety (89%). Districts did more than providing trainings for teachers: 51% of the districts employed full time individual who was responsible for enhancement of use of educational technology as leadership, and 32% of district employed such person as part time, and 17% of district had no one employed. When compared to 2000 report the importance given to process of integration was emphasized and districts employed people to support their integration processes. Therefore, responses of districts to believe in teachers' knowledge, ability and skills, and interest to integrate technology were higher in percentages than previous research results. On the other hand, 2009 survey revealed that nearly half of the districts stated lack of enough funding.

2.5.2. Access to Technology and Technical Support

Availability and access to technology are important factors affecting use of technologies in classrooms (Mumtaz, 2000; Göktaş, 2006; Topp, Mortensen, and Grandgenett, 1995; Becker, 1999). Gulbahar and Guven (2008) conducted a research to shed light on ICT usage and perceptions of teachers. 326 teachers were surveyed at primary level. The results showed that inaccessibility to ICT resources is an important factor inhibits use of technology in classrooms. The 70.6% of the teachers agreed that they are having problems about accessing to existing hardware (computer, overhead projector, etc.).

Barnett (2000) explained that for technology to affect learning there must be appropriate resources and 24/7 technical support. It is evident that there must be technical resources but there is another question: where? The place of technical resources is questionable because it possibly affects the use of them. Becker (2001) stated that "an important determinant of whether a teacher uses computers frequently with her students is whether the computers she has access to are within her own classroom" (p.3). NCES (2000b) showed that the percentage of teachers reporting

use of computers to large extent was 39% (computers in teachers classroom), but the percentage decreased to 18% for computers elsewhere in school. Moreover, NCES (2000b) reported that if the number of computers available in a classroom increases the teachers are more likely to use them in preparatory activities and assign students some tasks.

Hsu, Wu and Hwang (2007) expressed that school managers must provide technical and personnel supports for teachers so that teachers can integrate computers into teaching and learning. School managers can support teachers by the help of technical personnel and computer coordinators. NCES (2000b) report reveals that computer coordinators were expected to assist teachers with computer based technologies, and using technology in their classrooms. However, computer coordinators spent their time for teaching students rather than supporting teachers' technology use (Becker, 1998). Like the USA, within the framework of basic education project in Turkey computer coordinators were trained to support other teachers about ICT, computer-assisted learning (MoNE, 2001, cited in Özdemir & Kılıç, 2006). However, Özdemir and Kılıç (2006) reported that 75% of computer coordinators were not given formal duty statements, other teachers and administrators had negative attitude about them, and 35% of the computer coordinators complained about heavy workloads and insufficient time.

An exemplary case about the role and impact of a technology coordinator was presented by Daly (n.d), a technology coordinator. Daly, overall, found that technology coordinators have an impact on teachers' use of internet. Daly stated that when the technology teacher was available in the classroom and support the teacher, teachers use technology more and therefore suggested technology coordinators to be in classroom during the initial use of technology, model and conduct lessons, provide some kind of templates for teachers, provide trainings/workshops about basic computer skills, and provide 'how-to-do' videos. The recommendations show that technology teachers' first responsibility is to support teachers in terms of technology resources.

Actions towards Access to Technology

NCES (2000b) reported that “by 1999, most teachers [*reported to be 84 percent, p.39*] reported having at least one computer in their classrooms, and over half of these teachers also had access to the Internet in their classrooms [*italics added*]” (p.29). For Turkey, DPT (2009) reported that as January 2009, there were 27.897 computer laboratories established, infrastructure of schools were update to enable one computer per fifteen students. There were one projector, one printer, and one scanner in every school. DPT (2009) expressed that 94% of the primary schools were connected to the internet by 2009. However, when compared with the USA data which reported that there was at least one computer per classroom, Turkey data didn't tell anything about the computer ratio per classroom. Although, NCES (2000b) reported high number of computers present in schools, teachers stated that not having enough computers. The ‘not enough computer’ was found to be the most frequently stated barrier to teachers’ integration process.

2.5.3. Administrative Support

Mumtaz (2008) underlined the importance of institutions role in technology integration and indicated that institutions should explain what is meant by change (by integration of technology) and thereby removing the confusions and misunderstandings. OTA (2005) underlined administrators’ key role in technology integration and suggested “training administrators so they can serve as technology supporters” (p. 28) and “support for technology use from the principal and other administrators ... can create a climate that encourages innovation and sustained use” (p. 130). The literature pursued the role of the teacher in technology integration process, but, administrative staff must be the ones to be focused because they are the key to success of any technological system (Heinich, 1991b).

Özdemir and Kılıç (2006) suggested that “in-service training for computer-coordinators, principles, and classroom teachers in the theory, pedagogy and

technological aspects of ICT integration” (p. 914) for successful integration of ICT in education. Gulbahar and Guven (2008) identified that studies need guidance and support of administration. NCES (2000b) also outlined that lack of administrative support is one of the barriers to teachers’ use of computers or the Internet for instruction.

Leadership is generally described as an important factor affecting the integration of computer-based technologies in classrooms (Byrom and Bingham, 2001). Hsu and Sharma (2008) investigated the enabling factors in the technology integration change process. They state the importance of leadership in technology integration and they suggest training people, who will lead the change, in leadership and strategies of change [from traditional education to more technology enhanced education]. Based on the suggestion of Hsu and Sharma (2008) the suggestion of Özdemir and Kılıç can be updated that ‘computer-coordinators and principles, who are expected to be the leaders of the change, should be trained about leadership and change strategies’, too.

2.5.4. Attitudes and Beliefs about Computers and Technology

Papanastasiou and Angeli (2008) explained the importance of human factor for integration of ICT into schools by “... dealing effectively with ICT relates not only to knowledge of the capability, limitations, applications, and implications of ICT, but also to individuals’ attitudes and perceptions regarding ICT tools” (p. 69). Yıldırım (2000) and Mortz and Nash (1997, cited in Hung & Hsu, 2007) stated that teachers’ attitude towards computers determine their preference of using computer-based technologies in their classrooms. An interesting finding of Hung and Hsu (2007) was that they found $r^2 = 0.21$ for and teachers’ attitudes toward computers and their use of technology in classrooms. That 21% of the variance in use of computers could be explained by the attitudes of teachers. Mumtaz (2000) found teachers’ beliefs and the role of pedagogy are to be the major factors of ICT integration. Furthermore, Wong

and Hanafi (2007) showed that taking information technology course positively affected student teachers attitudes towards IT use.

Hung and Hsu (2007) presented variables about attitude. They pointed out that gender issue is investigated most and there is evidence in favor of males in terms of positive attitude towards computers. However, their study didn't find any significant difference considering gender, but they found significant correlation between computer use hour and attitude towards computers. Göktaş's (2006) study is consistent that male K-12 teachers perceive their competencies more than females in terms of being an ICT user. From a different point of view, Wong and Hanafi (2007) pursued attitudes towards information technology among pre-service teachers and they concluded no significant difference between male and female teacher students, too.

It has been shown that young people have more positive attitudes therefore in educational settings age becomes an important factor of attitude. NCES (2000b) indicated that teachers with less than three years of experience felt well prepared or very well prepared when compared to more experienced teachers.

Hsu, Wu and Hwang (2007) analyzed the factors influencing junior teachers' computer-based instruction practices. They found teachers' beliefs to be the biggest predictor that affected practicing computer-based instruction. They provide a solution to positively affect teachers' beliefs and attitudes towards computers: entry-stage teachers should visit expert teachers' classes to see how an expert teacher uses computer technology, and students. The authors also expressed that school culture is another factor that affects teachers' beliefs.

2.6. Related Research Studies

It is important to integrate technology in educational settings in order to enhance learning, moreover, the quality of the material that is going to be used must be

carefully designed and developed. Web sites that are prepared to support for the classroom instruction will be helpful to the students if they include:

- “Lesson summaries and educational games that aim subject repetition,
- Asking some questions about the lesson topic,
- Enables students to evaluate themselves with short quizzes” (Akkoyunlu, 1999, p. 81).

Wilson and Wright (2007) pursued teachers’ perceptions of technology integration and actual technology use over time. They followed the teachers from their teaching program, and in their teaching experience, four years later. Major characteristics of the teachers were that they attended to secondary social studies methods course, they were members of a technology rich education program, and they experienced various technologies during their preparation program. In their teaching experiences, they were observed for how and why they are using technology. Their technology use was categorized under five stages which are familiarization (learning how to), utilization (trying technology), integration (using for certain tasks), reorientation (focus on student learning, not only for delivery of content), and evolution (adoption of technology). The stages were adopted from Hooper and Rieber (1999). To note that the classification of stages refers to different meanings when compared to stages of utilization which was explained by Molenda and adopted by Seels and Richey (1994). For example the term,

Wilson and Wright (2007) found that there was only one teacher who remained in the *utilization stage* which means it does not matter for the teacher to use technology or not. The authors explained that there were also other issues such as lack of access to technological resources. Five teachers found to be matching with *integration stage*. The teachers at this stage used technology for their instruction. These teachers could also be divided into two groups, the ones with teacher-centered and others as being more student-centered. Both groups preferred presenting important knowledge through technology. However, their presentation strategies and intentions were

differed according to teachers' strategies. The authors explained that one teacher's, Ted, lesson flow: introductory session with PhotoStory, followed by a multimedia presentation, some document to present to class for whole class discussion, and finalizing with a DVD clip. Another teacher, Bob, used technology for communication outside of class with primary purposes of assignments, drafts, etc. The results characterize the student-centered teachers as considering the needs of the students, getting interest of students by the use of technologies, use of various kinds of technologies, and trying to find ways of motivating students. For the teachers at *reorientation stage* teachers used technology to support their content of lessons towards a more facilitating learning environment. From another point of view, one teacher was explained as preparing his lessons. An exemplary work accomplished by Tamika, who used technology for students to create documents such as creating a presentation about U.S history. *Evolution stage* teacher, only one, was explained to be using various types of technologies, providing an environment in which students discuss a subject topic with teacher guidance, helping other teachers to integrate technology (being a model).

In their study Young and Ku (2008) investigated uses and alternative ways of applying of ICT in primary education of Taiwan. They investigated four winning schools participated Problem Based Learning, PBL, web project contest. The results showed that students found teaching and outdoor activities very interesting and fun. The students participated to the study felt that the extracurricular activities helped them to learn new knowledge and skills. On the other hand, most of the students participated to the study (project-making activity) for winning a prize. Although, the authors explicitly stated about the presence of a prize at the end of activity, they didn't discuss in detail that students' high motivation about being part of a project and seeking to gain knowledge and skills are because of the nature of a prize. Young and Ku (2008) presented students' positive perceptions of the learning effects of PBL activities, but it's questionable that the positive perceptions were due to the strategies PBL or because of the reward provided for students at the end of the contest.

Karoulis, Stamelos and Angelis (2008) investigated the use of a learning aid as an instructional supporting tool in two courses. 191 undergraduate students participated to their experimental study. The students in the experimental group used the modified lesson sheet. At the end of the study students achievement in an examination was compared. The tool, lesson sheet was described by the authors:

In table format, it is divided into rows and columns. The left-hand column contains the outline of the lesson in paragraph form, while the right-hand column provides a variety of context-sensitive information that could be a summary of the subject under consideration, such as charts and graphs, pictures, or other material related to the discussed issues. In addition, adequate free space allows students to personalize the sheet with his/her own notes — information that should have meaning to students when they work at home (p.68).

Karoulis, Stamelos and Angelis (2008) based on their statistical analysis indicated that “use of lesson sheets does affect students’ performance on the test” (p.74). They interpret that student who used the lesson sheet more they were more successful based on the exam results.

Bottino and Robotti (2007) pursued that how e-learning techniques helped a teacher and evaluated primary school students’ acquisition of mathematical skills. They reported that activities requiring students to complete a partially implemented solution was found to be effective. They presented that students’ completion of activity correctly increased from 75% to 99% through sessions. Another property of the learning environment was simulations. Bottino and Robotti (2007) stated that the teacher used simulations to introduce a concept. The authors detailed the use of simulations by students. At the end of module 1 30% of the students perceived simulations as effective, at the end of module 2 the percentage was 50%. There were students didn’t use simulations and those students preferred asking their classmates or the teacher. The tests were not only used for evaluation purposes but also used for introducing specific remedial activities. Another function of the learning tool was to provide visual representations and assist students’ problem solving experiences.

A research by Arikan and Altun (2007) pursued' use of online homework sites by preschool and primary student-teachers in terms of attitudes, purposes/reasons of use, and suggestions. They found that the general attitudes toward online homework sites as moderate. Student teachers applied to those sites for saving time and because of lack of resources and high number of homework assigned by teachers, furthermore, they were directed by some other web sites, or by suggestions of friends. The student teachers' suggestions for such online homework sites included guiding rather than providing ready-prepared materials, and increasing the accessible library resources. They also suggested that some subject teachers or experts should evaluate the content of such sites.

2.7. Summary

As being an evolving field, instructional technology, the definitions related to the field starting from differentiating educational technology and instructional technology was explained. It was discussed that there are scholars who prefer using the terms interchangeably or as synonym because of the assumptions and definitions they make about education related concepts. Therefore, the relationship between educational technology and instructional technology was presented and the definitions of the field explained with comparing them each other.

As being at the hearts of the field and its very close relationship with this dissertation, the 'use' or 'utilization' domain is explained and the stages were defined. Although the terms are sometimes defined and explained from different points of view, the 1994 definition was based for explaining the domain of utilization for providing common understandings of the term and related concepts.

The statistical information about the current status and relationship of computers and schools were presented and efforts for supporting the use of computer-based technologies were explained. The literature mainly dominated by the USA as because of the USA is attributed to be the origin of the field, which affected the

educational system of the USA. The reports indicate that there have been investments with very high budgets to increase the use of computers in education. The efforts related to integration from Turkey perspective were presented. Requirements of effective use of technology were explained via presenting the factors affecting integration process. The literature indicated the barriers to use of information and communication technologies in schools. Based on the literature, preservice and inservice training (about how to use computers and how to integrate computers), access to technology and technical support, administrative support, attitudes and belief about computers and technology are the main factors identified by the most researchers.

Finally related research studies were presented. Among the others, the study of Wilson and Wright pursued the teachers' actual technology use. The researchers identified various characteristics of technology using teachers based on the stages described by Hooper and Rieber. Furthermore, some other researches were explained in terms of presenting exemplary situations or providing reasons for failure.

CHAPTER 3

METHODOLOGY

This chapter presents the purpose of the study, design of the study, participants, research context, data collection and analysis procedures, validity, reliability and limitations of the study.

3.1. Purpose of the Study

The purpose of this study is to investigate how a computer education teacher utilizes the online learning environment. The study tries to explain how computer education teacher uses information technologies in learning process, which methods s/he uses during the integration process of the online learning environment into the learning process, how s/he solves the problems s/he faced and expectations from an online learning environment. The main research questions that guide this study are:

- (1) How does a computer education teacher use and utilize the online learning environment?
 - (1.1) Which methods/strategies does a computer education teacher use during the integration process of the online learning environment into the learning process?
 - (1.2) What are the related factors affecting integration of online learning environment into curriculum?

- (1.3) According to a computer education teacher, what are the primary purposes of using an online learning environment?
- (2) How does the integration of the online learning environment affect the learning processes according to computer education teacher?
- (2.1) How does a computer education teacher perceived his/her students' progress?
- (3) What are the problems faced while using the online learning environment?
- (4) What are the expectations of computer education teacher from an online learning environment?
- (5) What are the perceptions of computer education teacher about integration and the use of technology by other subject area teachers?
- (5.1) What are the required steps/processes in order other subject area teachers to use and integrate technology into their curriculum?

3.2. Design of the Study

A quote from Greene and Caracelli (2003) clearly explains how an inquiry decision is identified:

applied social inquirers appear to ground inquiry decisions primarily in the nature of the phenomena being investigated and the contexts in which the studies are conducted. Inquiry decisions are rarely, if ever, consciously rooted in philosophical assumptions or beliefs (p. 107).

As Merriam and Simpson (1984) identified research as a systematic process, in detail a process of systematic data collection and analysis (Kırcaali-İftar, 1999). Yin (1994) defined a research design as “an action plan for getting from here to there, where here may be defined as the initial set of questions to be answered, and there is some

set of conclusions (answers) about these questions” (p. 19). In the following paragraphs, the design of this study is justified.

This research adopted qualitative research paradigm and case study in the form of action research for pursuing the study. The emphasis given both in overall and through data collection stages is qualitative because understanding the complex relationship with media on learning requires use of qualitative methods (Baran, 2007).

In their book named “Educational Research”, Johnson and Christensen (2004) used the term “*general kinds of research*” and list five kinds: “(1) basic research, (2) applied research, (3) evaluation research, (4) action research, and (5) orientational research” (p. 9). This study adopts action research according to Johnson and Christensen’s (2004) *general kinds of research* classification. Cohen, Manion and Morrison (2000) expressed that action research can be used: (1) *replacing a traditional teaching method by a new one*, (2) adopting an integrated approach to learning. Johnson and Christensen (2004) indicated that action research is carried out by “teachers, administrators, ..., and *sometimes collaboration with university-based researchers* [italics added]” (p. 11). Although many authors state that action research can be carried out by teachers, administrators and university-based researchers, they also underline that in action research most of the time the researcher is mainly the teacher. To note that, it is not a must that the researcher is required to be the teacher of the study. In fact, Yıldırım and Şimşek (2005) made it very clear by explaining the three types of action research and according to them ‘technical/scientific/collaborative’ type of action research is defined as (translated into English):

With this approach the aim is to test or evaluate an implementation (or practice) within a predetermined theoretical framework. Accordingly, *with the guidance of a researcher who has mastered aforementioned theoretical framework, a new approach can be put into practice and this process can be analyzed by the researcher, thereby an evaluation can be assessed.* The issues and problems came up during the implementation are provided to the researcher.

The researcher, according to his/her expertise, explains to the implementer how to act on the problem. The implementer, [*the teacher*], continues to the implementation according to the suggestions [*italics added*] (p. 296).

Yıldırım and Şimşek (2005) stated that a process that needs to be improved or to experience a new approach can be placed under possible topic sources of action research. To remember, the aim of this study requires experiencing a new approach that is using an online learning environment for instruction by a computer teacher. Similarly, Cohen, Manion and Morrison (2000) stated that action research “seeks to understand particular complex social situations and understand the process of change within social systems” (p. 228). Again, this study aims to explain: how the computer teacher uses information technologies in teaching/learning process. By integrating an online learning environment, the social context (of the teaching-learning environment) is changed and the integration process is focused. O’Brien (1998) stated that there has been an increase in the use of information technology and computer mediated communications in various organizations and this situation caused many convergences between information systems and action research for the last decade. O’Brien (1998) also provided examples of action research projects. Two of the examples “Internet-based collaborative work groups in community health” and “Computer conferencing in a learning community” matches the definitions provided here and show similarities with the logic of this research’s purpose.

In order to clearly state that; as a *general kind of research* this study uses action research and afore-cited excerpt from Yıldırım and Şimşek (2005) explaining ‘technical/scientific/collaborative’ type of action research best matches with the purpose of this study.

Detailed information about the phenomenon is explained in dept to examine and understand the related factors and to explore possible relationships. Aforementioned main research design of this study is based on qualitative ‘approach’ or ‘paradigm’ (as described by Johnson and Christensen, 2004) or qualitative research design (as defined by Merriam, 1998). According to Patton (1985, cited in Merriam, 1998),

“qualitative research is an effort to understand situations in their uniqueness as a part of a particular context and the interactions there” (p. 1). As the goal of investigation of this study is to understand the implementation in the natural context, the study carries the main characteristic of qualitative research.

Wallace and Poulson (2003) expressed the main objective of case study as investigating a case so that the case can be understood as fully as possible. In a detailed way, purpose of employing case study is to

“gain an in-depth understanding of the situation and meaning for those involved. The interest is in process rather than outcomes, in context rather than a specific variable, in discovery rather than confirmation.” (Merriam, 1998, p. 19)

Any definition of case study underlines the concepts; understanding (in depth), natural setting, complexity, and context. Aforementioned purpose of this study is to understand the integration process in its natural context matches with the definition provided Merriam. Mann (2006) stated that “...case study is very popular among researchers doing investigations of Internet-supported teaching and learning” (p. 70). Of course the explanation of Mann is not to imply ‘case study is used because it is popular’ rather his intention is to state the role and importance of case study for such investigations, especially for educational technology. As the use or tendency to use or encouragements for using technology increased, related educational technology researches increased with case study, therefore it can be perceived that it became popular.

Johnson and Christensen (2004) stated that although, there might be variations in application of case study research, all case studies have ‘focusing a case as a whole’ and ‘in its real life context’. Furthermore, Yin (1994) and Ekiz (2003) underlined that case study has an advantage when compared to other if the research purpose asks “how” and “why” questions. Willis (2008) stated that educational technology research mainly deals with how and why questions, for example; “why has the availability of technology in most American schools not led to more integration

across the curriculum” (p. 211). To remember that, the title of this dissertation is ‘how a computer education teacher utilizes an online learning environment’. Therefore, this study, as trying to understand how an integration process occurs in real life context, is defined as a case study. The purpose of this study also matches with Yin’s (1984, cited in Wallace & Poulson, 2003; cited in Yıldırım & Şimşek, 2005) list which explains that a case study “(i) investigates a contemporary phenomenon within its real life context, and (ii) the boundaries between phenomenon and context are not clearly evident” (p. 120).

As being an important element of the definition, Johnson and Christensen (2004), Wallace and Poulson (2003) asked the critical question ‘what is a case’? Wallace and Poulson (2003) provided an answer based on the explanation made by Miles and Huberman: a case is a “phenomenon of some sort of occurring in a bounded context” (p. 119). A similar definition was provided by Johnson and Christensen (2004) who indicated case as a bounded system, where the word ‘system’ is used to imply a set of interrelated elements. To provide more clear explanation, a case can be *an individual*, or a role, or a small group, or an organization, or a community, or a nation, or a decision, or a policy, or *a process*, or an incident, or event of some sort, and some other possibilities (Wallace & Poulson, 2003; Johnson & Christensen, 2004). The focus of this study is integration of an online learning environment by a computer education teacher. Therefore, the case is the *process* of utilization of the online learning environment *by the computer education teacher*. The process of utilization affects and affected by the teacher, the teachers teaching/learning strategies, the students, the activities during an instruction, or types of activities. Affecting and affected by situation is explained by Yıldırım and Şimşek (2005) as “... factors (environment, individuals, events, processes, etc.) related to a case are investigated in an integrated way and how they affected related case and how they are affected by related case is focused” (p. 77).

3.3. Selection of the Participants

Before presenting the methods and strategies used in sampling, a discussion about why a computer education teacher was selected as the main focus of this study needs to be explained. The study conducted by Göktaş (2006) showed that K-12 teachers do not perceive themselves as competent in terms of general ICT competency. Moreover, prospective teachers and K-12 teachers has the lowest competency in “use of LMS” and “use of ICT in analysis process of a course” (p. 160). Yıldırım (2001, cited in Göktaş, 2006, p. 160) provided the reasons which cause the above lowest competencies. He states that prospective teachers are trained on “basic ICT applications”, rather than “teaching with technology” (p. 160). Another finding provided by Göktaş (2006) is that “the remaining [75%] teachers either do not integrate ICT into their courses or they lack of sufficient ICT facilities” (p. 163). Finally, he presented the barriers for integrating ICT into K-12 schools. The major barriers are “lack of in-service training about ICT, lack of technical support, lack of hardware, and lack of basic knowledge-skills” (p. 167). He also supported his findings with the literature mainly from Turkey. This study focused on computer teachers to eliminate some of the major barriers so that the elements of the integration process could be examined. First, computer teachers, graduated from Computer Education and Instructional Technology department, have basic and advanced ICT skills, too. Computer education teachers do not need much technical support; they even provide technical support to school teachers and to school administration. A subject area teacher might have difficulties in having information technology equipments or access to them, but a computer teacher has the power of computer laboratories. Finally, computer teachers gain much knowledge about instructional technology, experience use of ICT, and evaluate software during their pre-service program. Therefore, a computer teacher can be a good candidate for using and integrating technology into curriculum by eliminating many of the barriers. In other words, this study targets a computer teacher purposefully to decrease some barriers and benefit from some enablers so that the focus can be given more to the

process of integration and interrelated elements. In the following paragraphs, general strategies that were followed to select participants of the study are presented.

At the uppermost, this study adapts nonprobability sampling strategies because the main goal of this research is not a generalization in a statistical sense rather it focuses on understanding of a phenomenon. The most commonly used sampling form of nonprobability sampling is purposive or purposeful sampling. To note that, Goetz and LeCompte (1984, cited in Yıldırım & Şimşek, 2005) used the term criterion based sampling as a synonym of purposeful sampling. Meriam (1998) defined purposeful sampling as being “based on the assumption that the investigator wants to discover, *understand*, and gain insight and therefore must select a sample from which *the most can be learned*” [italics added] (p. 61). Yıldırım & Şimşek (2005) provided a list of purposeful sampling methods (typical, unique, maximum variation, snowball, convenience, etc.) based on the classification developed by Patton in 1987. According to the methods provided, the convenience sampling is used for this study.

Among other methods of sampling methods; convenience sampling is used commonly, but it is suggested to avoid the use of convenience sampling (Yıldırım & Şimşek, 2005). However, the other sampling strategies do not match. In other words, this study requires participants to (1) voluntarily participate to the study, (2) spare much time than many other studies, (3) cooperate closely with the researcher, (4) do not hesitate providing any kind of information. The participants with these qualifications are the people who are close to the researcher. Although Patton (1990, p. 3) stated that convenience sampling is likely to produce “information-poor” cases, the author of this research study advocates that studying with participants who are very close to the researcher can provide in-depth and rich information because participants do not have any consideration (or hesitation) other than providing as much as information to the researcher. Therefore, for this study the main drive is purposeful sampling with use of convenience sampling method is applied. The sampling strategy of this study is presented in Figure 3.1.

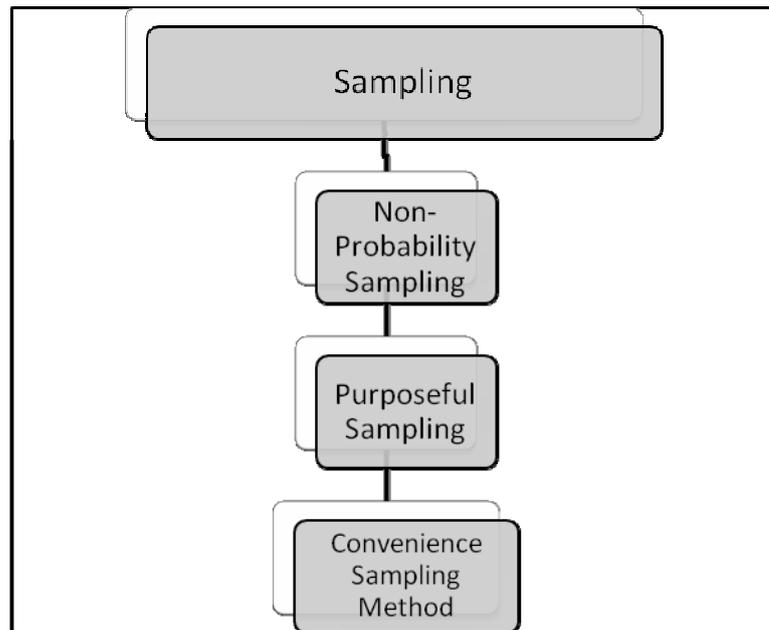


Figure 3.1: Sampling of the Study

3.3.1. The Computer Teacher

The computer teacher who used the online learning environment in his curriculum was graduated from Computer Education and Instructional Technology Department at a public university in Turkey at 2005. He has been a computer teacher for four years at a public school. The last semester he taught 17 hours a week and an average of 20 hours per week during the four years of teaching.

He is a democratic and tolerant teacher rather than an authoritative traditional teacher. His students can state their ideas without any hesitation. He defines himself as being stubborn in some situations. On the other hand, he states his ideas clearly and neatly, if there is something to discuss with his students he starts a discussion to get his students ideas. If there is an option of meeting half way, he does so. However, if there is not an agreement, then he explains his ideas again and does the things in his way.

3.4. Research Context

Research context is comprised of the computer course (information technologies course), the computer teacher, the online learning environment, the students and the computer laboratory. The computer course is explained in terms of content, the teaching/learning strategies it suggests and overall design features of the curriculum. Rather than repeating the information about the computer teacher, the existing teaching/learning methods that the teacher has been using is going to be explained. The online learning environment the computer teacher used is introduced. Brief information about the students and the computer laboratory are also provided. The components that form the research context are presented in Figure 3.2. The figure shows that all the components of the research context are related to each other. Although the emphasis given to some components (for example; computer course) are much than some others (for example, the computer laboratory), they are all connected and dependant to each other.

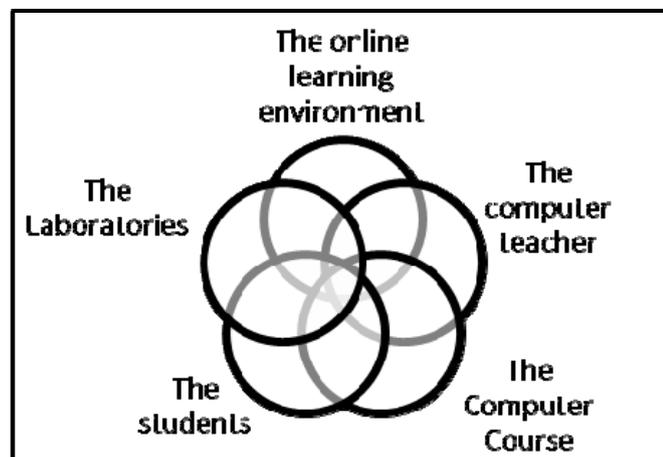


Figure 3.2: Research Context of the Study

3.4.1. The Computer Course (Information Technologies Course)

The implementation of this study is carried out by a computer teacher about whom information is provided above. The computer teacher has been teaching computer course from grade 4 to grade 8 at elementary school. The computer course was an elective course. There are two lesson hours in a week for fourth and fifth grades and one lesson hour for sixth, seventh, and eighth grades. The curriculum of the computer course (İlköğretim Bilgisayar Dersi Öğretim Programı, İBDÖP, 2006) was defined by Turkish Ministry of National Education (MoNE, 2005a). The whole curriculum (grade 1 to 8) of the computer course can be downloaded (100 pages, 4.23 MB) from: http://ttkb.meb.gov.tr/ogretmen/modules.php?name=Downloads&d_op=getit&lid=970. The [new] curriculum of the computer course was published on August 28, 2006. The curriculum is consisted of three levels and each level has steps. The level-step relationship is shown in Figure 3.3. Furthermore every step has units and every unit has learning gains. It is worth to note that the name of the computer course was changed to Information Technologies Course (ITC) on 04.06.2007 by MoNE. However, in order not to confuse or misuse with the term Information and Communication Technologies (ICT), the author of this study preferred the use of term Computer Course.

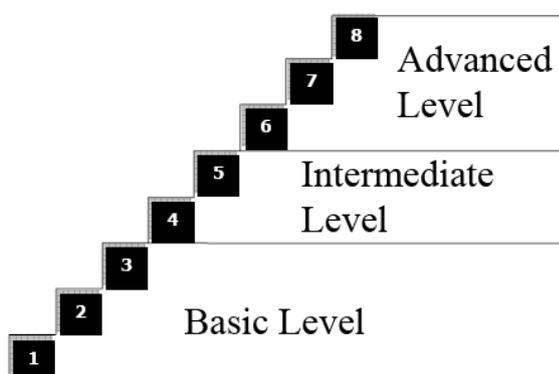


Figure 3.3: The Level-step Relationship of the Curriculum

At the end of each level, students are expected to show some predefined skills defined as performance indicators. For example, at the end of level one,

- “Students can be able to use; computers, input units (for example mouse, keyboard, etc), and output units (for example monitor, scanner, etc.)”,
- “With the support of teachers, parents or/and peers, they [*the students*] can gather information and communicate with other people” (İBDÖP, 2006, p. 14).

İBDÖP discusses the theoretical perspective behind the new curriculum by traditional learning environment and new learning environment. To define new learning environment, the theoretical strategies and approaches of constructivism were explained. The new curriculum was theoretically built on this new way of learning. Therefore, it was claimed that the new curriculum is student centered, encourages group working and information sharing, associated with the real world, active and discovery learning strategies are promoted. In general, it is stated that activity-based and learning by doing approaches are adopted for gaining the skills related to information technologies. Therefore, to achieve this purpose, İBDÖP suggests that problems related to real life should be presented so that students by forming groups can solve the problems. Based on the above propositions, İBDÖP provides a list of suggestions that should be followed by computer teachers. For example, it is stated that “There is a necessity of conducting activities which can be either intramural (i.e. *within the bounds of a school*) or extramural (i.e. *outside the bounds of a school*). A teacher should elaborately support each learning gains with alternative activities (activities with family, activities that address different intelligence domains, etc.” (p. 18). There are two activity examples provided in İBDÖP (2006, pp. 20-25). The activities follow five steps which are preparation, information share, implementation/practice, evaluation and resources. In the preparation step, general information about the planned actions and necessary equipments, timing, methods, etc. should be explained. Information share is a

prerequisite of the next step. Information share aims preparing students to lesson for providing information, revealing needs or making a sensation. For example, watching a short movie or visiting a web site can be an example for this step. In the implementation step, intramural or extramural activities which serve to the related learning gains are carried out. Evaluation includes understanding the resulting abilities. Evaluation can be a kind of presentation, a project, or a paper. Finally, resources are provided so that students who are interested in the subject can learn much information.

3.4.2. The Online Learning Environment

The Online Learning Environment (OLE) was developed under the supervision of Prof. Dr. M. Yaşar Özden at CEIT Department at METU. The OLE is consistent with the elementary education computer course instructional curriculum. It is worth to note that Mr. Özden was also one of the four members of the academic advisory board of the instructional curriculum. The OLE based on the İBDÖP's identification of the five steps which are preparation and general information, information share, implementation/practice, evaluation and resources for the activities. Each curriculum activity has these steps. These steps were organized as "Learning-gains learning objects in five steps" (Özden, 2008b).

The OLE has two main use of purposes targeted. The first one targets the teacher's use. The teacher can use the OLE to prepare his lessons. Secondly, the teacher can direct his students to study the subject matter from the OLE individually, or in groups. Afterwards, the teacher can have students discussing the topic, or present information to other students, or another kind of activity. Another strategy can be used by the teacher is to have students doing the activities presented in implementation step or students can do the interactive evaluation provided by the OLE.

The preparation or general information step provides information about the learning gains, its objectives, required equipments, time schedule of the lesson, and even how to carry out the lesson. Information share step has information about the topic that is going to be covered. Information share is supported by animations, simulations, images, discussion examples, demonstrations or sometimes PowerPoint presentations or short movies. An example from an information share page is shown in Figure 3.4. According to the subject the OLE has one or more of these supportive materials for the specific learning gains. For the implementation/practice step, the activity is presented. The activity is based on sometimes an explanation of a project, or a real life problem, or an interactive warm up quiz, or preparation of a document, or internet search and presentation, or discussion, or presentation of a movie and discussion, or an activity sheet and so on. Figure 3.5 shows an example of an implementation page. The teacher can either directly use the activities presented or direct his students to do the activity presented in the OLE. Some kind of evaluation strategies can be found at evaluation page. For example, as shown in Figure 3.6 below an interactive quiz can be an evaluation method, or a problem to be solved, or a project, or an interactive matching material, or homework, or a group discussion, or a group project can be listed as evaluation strategies that appear in the OLE.

The researcher and the computer education teacher conducted an orientation session about the online learning environment. The researcher explained the pages and features of the online learning environment to the teacher. The teacher investigated the online learning environment according to learning gains and the units of the computer course. Before to the implementation, the computer teacher used the online learning environment for the first three lesson hours of the seventh grade sections. The teacher used the online learning environment for the first lessons of 7A, 7B, and 7C sections as a pilot phase of the implementation.



Figure 3.4: Information Share Page of the OLE



Figure 3.5: Implementation Page of the OLE

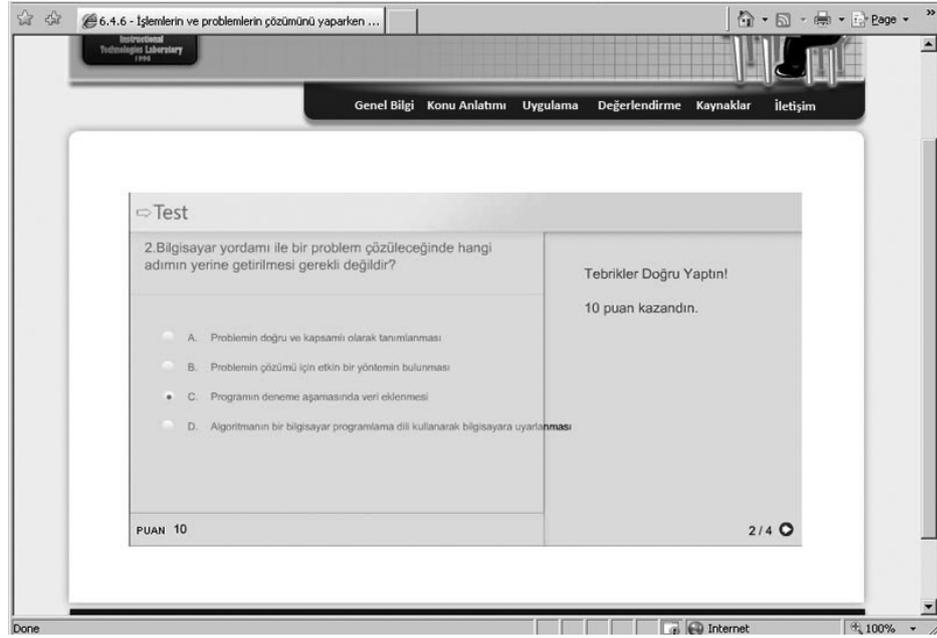


Figure 3.6: Evaluation Page of the OLE

3.4.3. Teaching and Learning Strategies of the Computer Teacher

General information about the computer teacher was provided before under section 3.3.1. Therefore, the former teaching/learning strategies which were adopted by the teacher are explained. The lessons were being carried out in a classical or traditional way. The computer teacher was presenting the subject that was going to be explained from an expository perspective at the beginning of the lesson. Afterwards, students were asked questions about the topic. If required a demonstration was shown by the teacher. After the demonstration, students were practicing by themselves. During practice session, if any student had problems, the teacher was helping. In case majority of students did not understand the information provided, or the demonstration, the teacher explains or demonstrates again. He was giving projects some times, but the restriction is that the project must be done during the laboratory

session hours. Figure 3.7 shows the former teaching strategy followed by the teacher, in the most general manner.

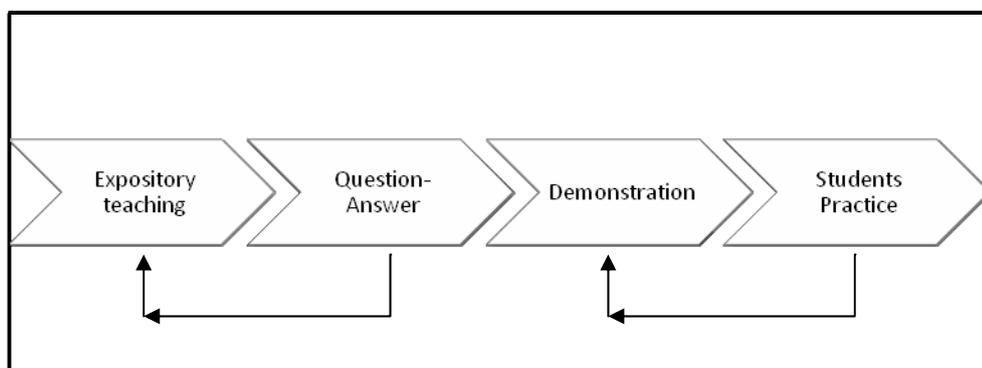


Figure 3.7: The Former Teaching Strategy Adopted by the Teacher

3.4.4. The Students and the Computer Laboratory

The research was carried out with ten classes with grades from 4, 6 and 7. There were some crowded classes, in these; students were had to share a computer. These classes were 6A* and 6B*. Considering other classes there was a computer per student. Table 3.1 shows the sections and the corresponding number of students of this study.

The computer laboratory was consisted of 16 computers. Technical properties of the computers were: Pentium III processor, 4 GB hard disk, 190 MB RAM, 64 MB graphics card, 15" monitor, mouse, keyboard and speakers.

Table 3.1: Grade Levels, Sections and Students

Grade	Class	Average # of Students
4	4A	12 – 16
4	4B	13 – 16
6	6A*	25 – 28
6	6B*	24 – 29
7	7A	13 – 16
7	7B	13 – 15
7	7C	14 – 16

3.5. Researcher Role

The researcher and the computer education teacher conducted discussion sessions for each lessons. The discussions held at the end of an interview session of a related lesson. During this discussion sessions the researcher and the teacher made a discussion to overview the lesson implemented and a kind of brain storming for the following lessons to be implemented. This exchange of ideas enabled the researcher and the teacher to overview the previous lessons and if necessary take actions for the future lessons. In chapter four the subheading “The Overview and Discussion of the Lessons” provides information about the interaction between the researcher and the teacher.

The roles of researcher were to (i) guide the computer education teacher, (ii) provide alternative perspectives, (iii) point possible problems or indicate some issues, and (iv) help or provide suggestions for solving problems based on researcher’s experiences and knowledge. During this discussion sessions, the researcher as a qualitative researcher, also tried understand the teacher’s considerations, expectations, previous experiences by asking challenging questions and requesting

comparisons for increasing the quality of discussions so that the teacher could provide more in dept information.

For example, at the end of an interview session, the teacher and the researcher discussed the teaching/learning strategy related to the specific class. The discussion included both teacher's and students' activities. In case the teacher indicated that something had gone wrong with a class, meaning that the application and use of the online learning environment was not resulting in a positive/expected way or there was a classroom management problem, the situation was discussed. The teacher and the researcher tried to overcome the situation by discussing teaching/learning process of that specific class. In some cases, the teaching/learning methods were changed or learning activities were revised or homework was assigned, or collaborative assignments were implemented, or even sometimes the weight given to the use of the online learning environment was reduced and sometimes the online learning environment wasn't used. The agreed decision was noted by the teacher so that in the following lessons of that class, the new strategy can be applied by the teacher.

3.6. Data Collection Instruments

The study focuses on understanding the process and related elements via computer teacher's use of the online learning environment. The main drive of the study is qualitative; therefore qualitative data collection methods were employed. Marshall and Rossman (1999) described four fundamental methods: "(1) participation in the setting, (2) direct observation, (3) in-depth interviewing, and (4) analyzing documents and material culture" (p. 105). Yıldırım and Şimşek (2005) defined interview as the most widely used way of data collection in qualitative research. Johnson and Christensen (2004) distinguished interviews that are done face-to-face ("in-person interviews", p. 178) and interviews conducted over telephone ("telephone interviews", p. 178). By following this classification, this study can be placed under telephone interviews. The teacher and the researcher were at different cities. Therefore, compulsorily, the interview sessions were conducted via telephone

and over the Internet; MSN[®] was used as a primary communication tool. At the end of each weekday the researcher and the teacher made a video-conference based interview, if possible, otherwise telephone was used. Video-based conference enabled the researcher to sense the mimics of the teacher. The type of the conversation is explained in the following paragraph. The overall data collection method of the study is presented in Figure 3.8. The figure shows the data collection method in a narrowing form based on the definitions provided in the preceding paragraphs.

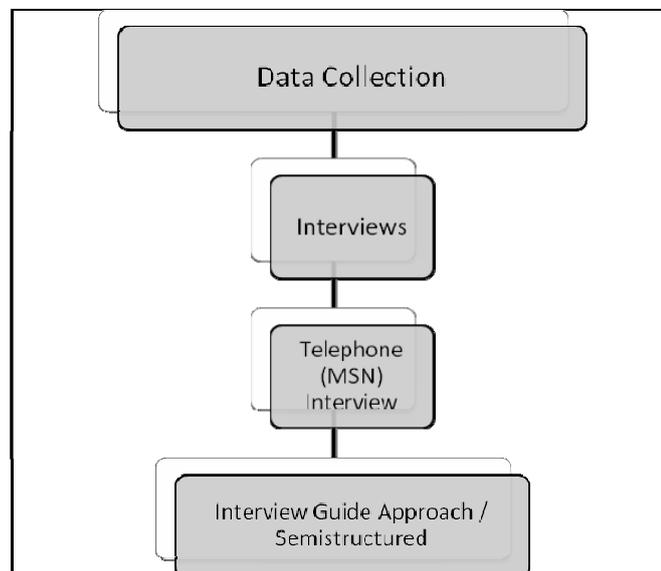


Figure 3.8: Data Collection Instruments of the Study

According to Patton's (2002) continuum there are three major styles of interviewing: (1) informal interviews, (2) interview guide approach, and (3) standardized open-ended interviews. In this study interview guide approach was applied. The conversation between the teacher and the researcher was carried out by following an interview guide. From another perspective, Merriam (1998) provided a continuum considering the 'interview structure'. She provided three types of interviews which

are highly structured/standardized, semi-structured, and unstructured/informal. According to the definitions provided by Merriam (1998) the data collection of this study is semi-structured type of interviewing. Open-ended questions and pre-determined “probes” (Johnson & Christensen, 2004, p. 178) were developed. Morse and Richards (2002, as cited in Göktaş, 2006, pp. 74-75) stated that “unplanned and unanticipated probes may also be used in semi structured interviews”. In detail, there were six main categories in the interview; (1) information about the class/grade (background and demographic), (2) how the lesson is carried out (experience), (3) the effect of the online learning environment to the learning environment (experience and opinions), (4) students’ progress (experience and opinions), (5) problems faced and causes of these problems (experience and opinions), (6) evaluation of the learning environment specific to the lesson and to the class/grade (experience and opinions).

Yıldırım and Şimşek (2005, pp. 127-128) listed the procedures of interview; “preparation of interview guide, testing, arrangement of the interviews, making necessary preparations, and carrying out the interviews”. The first interview guide, named as “Interview Guide for the Computer Education Teacher about the Implementation of the Lesson” (see Appendix A), was for understanding the teacher’s use of the online learning environment. The second interview guide was developed for learning the computer teacher’s perceptions and opinions about use of similar learning environments by other subject area teachers and general opinions about use of online learning environments. The second interview guide was named as “Interview Guide for the Computer Education Teacher about Use of Online Learning Environment” (see Appendix B).

The interview guides were examined by a Ph.D. candidate in the domain of instructional technology and some modifications were made according to the suggestions related to clarity and focus of the questions. There was not an option of testing the interview guide with another teacher because requesting another teacher to implement a different strategy of teaching/learning for an hour or two was not

realistic. However, the computer teacher, who was going participate to the study was piloted the interview process. There were two interview sessions with the computer teacher aiming to test and accommodate to interview processes.

3.7. Data Collection Procedures

After agreeing with the teacher about the use of online learning environment in his curriculum, the researcher also informed that there is going to be interview sessions and like participating to the study, participating to the interview sessions is also voluntarily. Therefore, it is explained that the researcher requires a signed consent form (see Appendix C) from the computer teacher. The teacher signed the consent form and posted it back to the researcher. Aforementioned strategy of testing the interview guide and accommodating to the interview processes was conducted with the computer teacher.

The computer teacher and the researcher agreed to interview at every weekday evening and when possible some earlier time. Before beginning to the study, the teacher was informed about the scope of interview sessions and stating that the aim is to understand in-depth what happened during a lecture hour of a class. Therefore, the teacher was suggested to take some notes to assist/remember during the lecture hours. The notes the teacher took was a helpful strategy for the teacher to remember the events occurred during the lecture sessions.

There were 25 interview sessions conducted over four weeks of implementation and Table 3.2 presents the details of interview schedule. Each interview session took approximately 20 to 50 minutes. Some interviews sessions covered two different classes at the same grade, for example 4A and 4B classes were following the same curriculum and therefore same strategies were applied. In Table 3.2 such classes are presented in the same grade row. The teacher indicated that it would be nearly the same interview process so there was not a need to interview in detail such cases separately. However, the different incidents/cases, if exists, were expressed by the

teacher and the possible reasons of this situation were discussed with the researcher. If the curriculum was different for the same grade classes they are presented as separately like 6A and 6B. During some interview sessions, the researcher interrupted the teacher time to time. For example, when the teacher said “for a short time we discussed ...”; after completing his statement the researcher interrupted and asked that “you said for a short time, can you tell approximately how many minutes”.

Table 3.2: Interview Schedule

Grade	Class	Interview Dates	
4	4A / 4B	Week 1: 06.05.09	Week 1: 07.05.09
		Week 2: 13.05.09	Week 2: 14.05.09
		Week 3: 27.05.09	Week 3: 28.05.09
		Week 4: 03.06.09	Week 4: 04.06.09
6	6A	Week 1: 04.05.09	
		Week 2: 11.05.09	
		Week 3: 18.05.09	
		Week 4: 25.05.09	
6	6B	Week 1: 05.05.09	
		Week 2: 12.05.09	
		Week 3: 26.05.09	
		Week 4: 02.06.09	
7	7A	Week 1: 12.05.09	
		Week 2: 26.05.09	
		Week 3: 02.06.09	
7	7B / 7C	Week 1: 11.05.09	Week 1: 11.05.09
		Week 2: 18.05.09	Week 2: 18.05.09
		Week 3: 25.05.09	Week 3: 25.05.09

3.8. Data Analysis Procedures

The study was driven by qualitative approach and the collected data were qualitative, therefore the analysis of the data was employed qualitative data analysis methods. Yıldırım and Şimşek (2005) explained the classification/ways of qualitative data analysis process based on Wolcott's definitions. According to them three approaches/concepts are needed to be described; (1) description, (2) analysis, (3) interpretation. 'Description', in short, can answer the question of 'what', 'Analysis' focuses on conceptual coding and developing themes through classification and making meaningful relationships. Therefore, it can answer the questions in the form of 'why' and 'how'. Finally, 'Interpretation' focuses on *meaning*, and therefore it gives much emphasis on the interpretations of a researcher.

Miles and Huberman (1994) described data analysis processes in three categories; (1) data reduction, (2) data display, (3) conclusion and verification. Johnson and Christensen (2004) elaborated the above three categories and describe the basic practical procedures like a roadmap used in qualitative data analysis; (1) transcribe data, (2) reading the transcripts, (3) segmenting and coding data, (4) enumeration of words and formed categories, (5) searching relationships and themes, (6) generate diagrams to help interpretation. The most widely used classification in qualitative data analysis was provided by Strauss and Corbin (1990) who classified qualitative analysis into two; namely descriptive analysis and content analysis. This study employs content analysis which aims to reach concepts and relationships that can explain the collected data (Yıldırım and Şimşek, 2005). The author of this study prefers to explain data analysis procedures in four steps; "(1) coding, (2) developing themes, (3) organizing codes and themes, (4) defining and describing the findings and interpretation" (Yıldırım and Şimşek, 2005, p. 228).

The data analysis of this study is as follows; the data were read, meaningful sections (words, sentences, etc.) underlined, and a concept was tried to be related to the meaningful data piece. The researcher re-read the data, and paired the codes together,

and if necessary renamed some codes. The coding was formed according to some predetermined concepts and the concepts emerged from the data. Afterwards, the researcher made an effort to categorize the codes in order to create and develop themes. In other words, the codes and classification of codes was tried to be placed under an upper theme. The researcher again re-examined the codes so that the data can be re-arranged according to the themes emerged so that the codes can be fully placed under themes, and the relationship of themes can be revealed. Finally, the themes, concepts and the relationships, if ever exists, between themes were interpreted by the researcher.

The reporting of results adopted the following suggestions of Hitchcock and Hughes (1995, p. 317, cited in Ekiz, 2003); events should be explained in depth, events/actions should be explained in a chronological way, perceptions, thoughts and opinions of the people under study should be focused, and special incidents of the case should be explained. Johnson and Christensen (2004) suggested that a qualitative research report should provide narrative report and rich description (detailed writing). Based on the suggestions, the results are provided in a chronologically and in narrative way, opinions of the teacher is emphasized, process is explained as much as possible, and not only process is focused but also special incidents are provided.

3.9. Validity and Reliability

Validity and reliability are the two main criteria which are used for evaluating a research study's quality. Although, the concepts are generally mentioned with quantitative research, Cohen, Manion and Morrison (2000) expressed that they are also applicable to the qualitative researches. Validity can be defined from various perspectives. For example, from a quantitative perspective the question "Am I measuring what I am supposed to measure?" can be used to explain validity of an instrument. Yıldırım and Şimşek (2005) provided a more general definition of validity which deals with the accuracy/truth of the results.

The literature on trustworthiness or validity of qualitative research can be categorized into two; (1) the authors who use the tradition of quantitative research (Cohen, Manion & Morrison, 2000; Meriam, 1998; Kirk & Miller, 1986) and (2) the others who develop alternative terms (Lincoln & Guba, 1985, cited in Savenye & Robinson, 2003). Although the definitions or the scope of validity can differ from author to author, there is a common view that validity should be perceived as “matter of degree rather than as an absolute state” (Gronlund, 1981, as cited in Cohen, Manion and Morrison, 2000, p. 105). It is not possible to have hundred percent of validity (Yıldırım and Şimşek, 2005). Standards for Educational and Psychological Testing authorities (1999, as cited in Johnson & Christensen, 2004, p. 141) defined validity as:

... It [*validity*] is the degree to which all the accumulated evidence supports the intended interpretations of test scores for the proposed purpose

Therefore, most of the time authors of educational research denotes sections such as threats to validity, how to increase validity of a research, strategies that can be used to ensure validity. External validity (or generalization) deals with the transferability of the findings to similar groups or situations. Internal validity is related to how findings and procedures followed to reach the findings matches the reality. Table 3.3 presents the strategies that were used to ensure validity and reliability.

Reliability is formally defined by Yin (1994) that “... the operations of a study – such as the data collection procedures can be repeated, with the same results” (p. 33). In other words, if a researcher wants to conduct the same study (not replicate) by following the same procedures explained in the previous study, the researcher should find the same results and come to same conclusions. However, Cohen, Manion and Morrison (2000) stated that reliability stands for consistency and replicability over time, over instruments, and over groups of people. On the other hand, Yıldırım and Şimşek (2005) clearly stated that qualitative research accepts from the beginning that it is impossible a qualitative study to be replicated and to be found the same results in

another study, rather they use the term transferability (stands for external reliability). As a practical suggestion, in order to increase reliability, the procedures of the study should be explained in detail. Similarly, Yıldırım and Şimşek (2005) stated that qualitative research does not use reliability as used in quantitative research, rather qualitative research focus on coherence/consistency.

Table 3.3: Strategies for Validity and Reliability of the Study

Concept	Strategy used	Application
Internal Validity/ Trustworthiness	1. Member checking	Transcripts of the interviews, results and interpretations are reviewed and confirmed by the computer teacher
	2. Peer examinations	The interview data and coding was examined by peers.
External Validity/ Transferability	1. Thick description	The data was provided by in-depth descriptions and without interpretations. Direct quotations were used frequently.
Internal Reliability/ Consistency	1. Providing Consistency	The data collection procedures, instruments and analysis are done in a consistent way.
	2. Peer examination	Data analysis included peer examination.

3.10. Limitations

The following limitations can be stated for the study:

- First of all, the researcher is the main data collection instrument and analyses were done according to researcher's world view, knowledge, experience and abilities. Different strategies were used to minimize the researcher bias, but it is impossible to exclude researcher effect from the study. Therefore, similar to other qualitative studies, the researcher is one of the limitations of the study, which should be mentioned first.
- Similar to the researcher effect, the participants, who are also human beings, has an effect on the study. Although, it was explained that the computer teacher was chosen based on some characteristics so that s/he can provide rich information. No matter what criteria were used, the validity of this study is limited to the accuracy and honesty of the participant.
- Validity of this study is limited to the validity and reliability of the instruments used in the study.

CHAPTER 4

RESULTS

This chapter presents the findings of the study. To remember, the purpose of this study is to understand how computer teachers utilize the online learning environment to enhance their instruction. The study focuses on the utilization of online learning environment by the computer teacher. The data were collected through interviews with the teacher.

4.1. Implementation of Lessons

The interview schedule, see data collection procedures in the former chapter, presents the interviews of this study. The results are going to be presented according to grades so that the teaching/learning strategies that the teacher used can follow a logical sequence and form a unity.

The following headings use the format sequence like: grade (4, 6, or 7), section (either A, B, or C), number of the interview (1, 2, 3, 4, or 5). Therefore, 4A-I2 stands for the interview result of the 4th grade and section-A, and the second interview (week-2) with the teacher. It is worth to note that as explained in the former chapter, if the same level and unit were followed for classes they are presented together. In case there were differences in terms of teaching/learning methods, classroom management, or any other issue, the teacher informed the researcher during the relatively short interview session of the other section. For example, the curriculum

were the same for the 4A and 4B sections, therefore they are presented together. Similarly, the findings of 7A, 7B and 7C sections were presented together.

There are sub-headings under the heading of each interview session. The sub-headings are; (1) How was the Lesson Carried Out?, (2) The Teacher's Notes, (3) The Teacher's Perceptions about Students, (4) The Problems Faced During Implementation, and (5) The Overview and Discussion of the Lessons.

'How was the Lesson Carried Out?' section explains how the teacher implemented the lesson from beginning to end. This section tells what happened in the class in a sequential way. 'The Teacher's Notes' section explains the teacher's observations and expressions about the distinct or unexpected events of the lessons. 'The Teacher's Perceptions about Students' section explains the teacher's observations and perceptions about the students. How the teacher perceived his students during the lesson is tried to be explained. 'The Problems Faced During Implementation' focuses on the specific problems occurred during the implementation. Problems can be technical problems, or management problems, or problems caused by the OLE or use of the OLE or any other unexpected problem. Finally, 'The Overview and Discussion of the Lessons' tries to evaluate the lessons conducted and discuss the events of the next lesson so that the teacher and the researcher can be sure that they are speaking the same language. Therefore, the teacher can have ideas for the implementation of the next lessons.

4.1.1. Results of 4A and 4B

4.1.1.1. General Information About the Curriculum of 4A and 4B

The basic information about the grade-4 curriculum followed by the computer teacher is explained here. Both 4A and 4B sections followed the same curriculum. Information about the curriculum of the computer course (İlköğretim Bilgisayar Dersi Öğretim Programı, İBDÖP) is presented under "3.4.1.The Computer Course

(Information Technologies Course)” section. The computer teacher followed Level-4 (Intermediate Level) curriculum. The unit was “Unit-3: Presenting my information”. Table 4.1 presents the implemented curriculum of grade-4.

Table 4.1: The Implemented Curriculum of 4A and 4B

Curriculum Feature	Details
Level	4 (intermediate)
Unit	3 – Presenting my information
Learning Gains (level.unit.learning-gain)	4.3.1. Realize that word processing software is not enough for presenting information 4.3.2. Prepare a presentation by using appropriate techniques 4.3.3. Enrich his/her presentation by adding visuals that are appropriate with the purpose of the presentation 4.3.4. Change the appearance of the presentation by using appropriate techniques 4.3.5. Share his/her presentation with his/her friends
Lesson hours	2 hours in a week
Unit duration	11 hours

4.1.1.2. Results of 4A – II and 4B – II

At the end of this unit, the students were going to have a completed presentation as performance homework. The teacher indicated that he already explained the details and requirements of the performance homework in the previous lessons. The implemented lessons of the first week aim the learning gains “4.3.1. Realize that word processing software is not enough for presenting information” and “4.3.2. Prepare a presentation by using appropriate techniques”.

How was the Lesson Carried Out?

The teacher stated that he first introduced the students with two different kinds of documents which were present in the “Practice CD for Activities” provided by MoNE. Teacher showed a word document and a presentation which were about “Ecosystem, Natural Equilibrium and Human”. The teacher and students discussed about the differences between the two documents and the aims of the documents. Afterwards, the teacher explained the term “presentation”. Then the teacher directed his students to the Online Learning Environment (OLE), which also had two different kinds of documents and some questions. Teacher requested his students to study individually and investigate the two documents and provide answers to the given questions. The answers of the students were discussed together in order to differentiate the aims of word documents and presentations. During the discussion the teacher also underlined the formal definitions of “presentation” and “slide”, too.

Afterwards, the teacher introduced the students with PowerPoint software. The teacher expressed that the PowerPoint is a kind of software like Ms-Word. The teacher also indicated that many of the menu items and buttons are similar to Ms-Word program, but also there are differences, of course. The teacher directed his students to the OLE in order to have them watching the short video (2 minutes 30 seconds) demonstrating how to open the PowerPoint program, how to add new slide, how to prepare a title slide, how to add text (heading and body/content) to new slides and how to show presentation (slide show). The teacher expressed that he was going to choose a couple of students to show the steps to his/her friends via projector. The teacher told that everyone was required to prepare a short presentation about them. The teacher showed the related evaluation page of the OLE. Students’ presentations were going to have four slides which are ‘my information’ (two slides), ‘my hobbies’ and ‘where I live’. At the end of the lesson three students were chose to present their presentations to their friends. During the presentation of the first student, teacher interrupted the student and expressed the concepts like heading of a slide and body of a slide, again. The teacher informed the students to save their files because next week

they were going to make some changes to their presentations like adding some pictures and changing the visual appearance (slide design) of the presentation.

The Teacher's Notes

The teacher indicated some points related to the implementation of the lessons therefore, not only teaching/learning process but also other aspects of the process can be understood from the teacher's point of view. The teacher clearly indicated that

“when I demonstrated how to complete an operation/procedure, for example saving a document, or creating a new slide, previously, I usually interrupted by the students who did not understand, or who had technical problems, or who were too slow to follow my demonstration. This caused, totally stopping my demonstration and starting over again, or speaking to these students that ‘after the demonstration was completed I was going to help them’. However, when I directed my students to the OLE, which actually demonstrates instead of me, I had two kinds of student groups, ones who can watch the demonstration and perform the task without a problem, and others having problems with performing the task given. Therefore, I had time for individually guide these students. Therefore, I was able to help each student without making other students wait. [T-1]”

The researcher asked that “Can you compare the time spent by your demonstration and the demonstration provided by OLE?” The teacher stated that

“indeed, I can say that both demonstrations more or less took the same time. However, the important point is that when I demonstrated, I felt that I was interrupted too many times. On the other hand, when students were individually practicing I could able to concentrate on the students who had problems with performing the procedures. In conclusion, I prefer the demonstration provided by the OLE. [T-2]”

Another point stated by the teacher is that “previously, when I gave a task to complete, some students, who had difficulties completing the steps of the task, called me and I showed/demonstrated the steps to them individually. On the other hand, with the OLE I observed that some students refer to the demonstration in the OLE

while performing their tasks. Clearly, those students figured out that the demonstration presented in the OLE is always there and they can watch it again and again when they needed. Therefore, there was a decrease in the number of students who require my help or guidance to perform the task in hand”.

The teacher indicated that in 4B section one of the students asked that “my teacher, you showed both the documents via projector, I can’t see much difference between them. We can use both for showing information to people. Moreover, if we use Ms-Word we can show much information to people via projector”. The teacher stated that

“I thought we clearly discussed the differences between word processing software and presentation software. However, the idea that the student stressed was not totally wrong. Sometimes we use Ms-Word to present vertical figures that do not fit into a slide. Therefore, as whole class we discussed again the aims of the word processing software and presentation software. I also introduced the term readability and pointed out the importance of readability. I showed a long text both as a word document and a presentation so that the visual difference between them could be clear. Moreover, I explained that in a presentation the main purpose is to give the main idea or summary of a long text, but in a word document people can provide long text to be read in detail. [T-3]”

The Teacher’s Perceptions about Students

The teacher stated that with use of the OLE, his students became aware of reaching information by them from another source. The students were also aware of that the teacher was also present to observe their actions and provide help in case they need similar to previous lessons. The teacher expressed that his students were able to realize that instead of teacher’s expository teaching, they were at the center. In other words, they differentiated the difference between teacher-centered teaching and student-centered learning. Indeed, the teacher expressed that one of his students told that “my teacher, now are we became teachers of the class because we are studying and explaining the lesson topic”. However, interestingly, in the other section (4-B),

one student asked to speak and asked that “if we study by ourselves and watch the demonstration, what are you going to do?” The teacher explained to the class that

“now, I can spare much time for those who have difficulties while performing the given tasks. Moreover, by discussing the terms and topics you become active in the learning process. [T-4]”

“I do not know whether the students really understood what I told or not, but somehow they convinced that this way of teaching/learning is better. [T-5]”

The Problems Faced During Implementation

The teacher expressed that there were no major problems in terms of technical or classroom management during the implementation of the sections, 4A and 4B.

The Overview and Discussion of the Lessons

As agreed before, at the end of each interview the teacher and the researcher made a discussion to overview the lessons conducted and the next lessons. This exchange of ideas enables the researcher and the teacher to overview the previous lessons and if necessary take actions for the future lessons. The researcher indicated that next week the students were going to learn how to insert pictures and change slide designs. The researcher suggested that it would be good to mention about some visual design concepts and tactics. For example, where to place a picture within a slide, choosing appropriate slide design in terms of providing contrast between text and design, picture and design. The teacher told that in previous semesters if he had time, he mentioned about these concepts and explained the importance of visual design. The researcher stated that it would be better if students know about these terms. They agreed that after showing examples to students, the teacher was going to stress the importance of the concepts. Moreover, the researcher stated that if it would be possible in terms of time, at the end of the course when students presenting their presentations, providing a discussion about whether the class liked the presentation,

is there any visual design problems, whether the text in slides are readable and so on can be a good experience for the students.

4.1.1.3. Results of 4A – I2 and 4B – I2

At the end of the second week, the learning gains “4.3.3.Enrich his/her presentation by adding visuals that are appropriate with the purpose of the presentation” and 4.3.4.Change the appearance of the presentation by using appropriate techniques” were aimed to be achieved.

How was the Lesson Carried Out?

The teacher stated that at the beginning of the lesson he asked questions like “what is presentation? What is slide? And what are the differences between a word document and a presentation?” in order to have students remembered the terms. Teacher asked to the students that “Is there a volunteer to show us how to open PowerPoint, how to add new slide and how to enter text into heading and body sections?” The teacher chose one student from volunteers to perform the tasks sequentially. The teacher interrupted and told to the student that “You should speak aloud so that your friends can understand what you are doing and demonstrating.” The teacher indicated that this preparation to the lesson took approximately ten to fifteen minutes. Afterwards, students were informed to open their presentations they saved last lesson. Last week the students prepared a presentation about themselves and in today’s lesson hours they were going to add pictures into their slides and they were going to change the visual appearance (slide design) of their slides. The teacher showed two different presentations to his students. Each presentation had different slide designs and the slides of the presentation were enriched by pictures. The teacher and the students were discussed about the importance of visuals, how they attract people attention, how they help us to remember, the importance of readability and contrast. The teacher told to the students that “you are going to add pictures to your presentation and change the design of your presentation. Whenever you need, you can watch the

demonstrations provided by the OLE. If you have any questions related to completing the steps or any other question, let me know. I will help you to achieve the steps”. The teacher directed his students to the OLE which provides demonstrations of ‘inserting a clipart picture and inserting a picture from file’ (two minutes) and ‘changing the slide design’ (fifty seconds). The teacher reminded his students to frequently save their work. Teacher stated that students started to watch the demonstrations and tried to add pictures to their presentations. Teacher noted that “some students asked that they do not have pictures in their computers. I understood that what they were trying to say actually was that they didn’t have any pictures of them rather than default windows pictures or clipart pictures”. The teacher expressed that he told to the students “I know many of you don’t have pictures already exists in your computer, however you can download/save pictures from Google. Thereby, you can use the picture downloaded from Google.”

In the second hour, the students continued to enrich their presentations. The teacher stated that I let the students who want to add more slides to their presentation. For example, one of the students asked that “my teacher, can I prepare a slide for the football/soccer team that I support?” The teacher clearly told to the class that “if you want you can add more slides and more pictures according to your interests. Remember that I am going to choose a couple of you to present your presentations”. The teacher stressed that although some of the students prefer to watch the demonstrations of the OLE again, some other preferred my demonstration rather than watching the demonstrations second time from the OLE. The teacher noted that generally, the students who preferred the OLE were the ones that were already much familiar with computers and therefore learn quicker.

In the last ten minutes the teacher chose three students to present their presentations. The teacher stated that he asked to the class whether they liked the presentation or they were able to read easily, whether the slide design was appropriate in terms of readability and contrast (text/picture). At the end of the lesson, the teacher informed his students about that next week they are going to prepare a presentation about a

topic they choose. Therefore, it was reminded that it would be better if they choose a topic and make some research about their topic for the next week's lessons.

The Teacher's Notes

The teacher stated that "Last week, I had forgotten to remind students for bringing with them one or two photos (in floppy disc or in flash memory). Though, even if I had told, most of the students would have probably forgotten to bring". Therefore, he stated that he told to his students to download images from Google to insert into slides. The teacher observed that some of his students made a copy-paste action instead of downloading an image to the hard disk and then inserting the picture into a slide. He stated that I warned those students to download the pictures rather than doing a copy-paste.

The teacher noted that in 4B section, some students asked to the teacher to re-demonstrate, although they had watched the demonstration provided by the OLE. The teacher indicated that after demonstrating to three students, "I figured out that they were asking for help because some of them thought that I was doing the tasks instead of them". The teacher stated that

"I found a solution to this that I didn't show the steps in the students' presentation rather I created a new presentation and demonstrated the steps in the new document. So that I wanted the students can clearly understand that I was not going to do the steps instead of them, rather my guidance covers showing the steps of inserting a picture, or changing the slide design. [T-6]"

Lastly, he stated that although he mentioned about the importance of visual design concepts students, especially girls, prefer more colorful text and slide designs rather than a well-contrasted design. The teacher stated that "I am used to see such designs, because if a design seems beautiful to them it means it's good for them".

The Teacher's Perceptions about Students

The teacher told to the researcher that

“I observed that my students were used to use the OLE. Moreover, I believe that their self confidence was raised because they knew that without asking to the teacher they were able to learn, complete a task. Another point that took my attention was that, there was more participation to class discussions. I guess that, students knew that they didn't have anything to miss. In other words, they know that they were always able to refer to the OLE when they need. For example, sometimes they paused what they were doing, they participated to the discussion or listened to me, and then they continued to their work. Another point to note that when there was a discussion, interestingly some of them provide answers from the OLE, even some directly read from it. [T-7]”

The teacher underlined that his students know that there was another information source they can refer to. He told that “I want to underline that students referred to the OLE while they are completing their presentations as many as they needed. Moreover, I saw that some of my students used alt+tab keys to switch between the OLE and PowerPoint.”

The teacher stated that in today's lesson some of the students, the quick learners, finished their presentations earlier (approximately ten minutes) than the remaining. The teacher stated that this also occurred in his previous lessons and it is usual.

The Problems Faced During Implementation

The teacher indicated that there were no major technical problems during the implementation. The teacher told to the researcher that “as I mentioned, in today's lesson some students were finished preparing their presentations earlier than the others. These quick finishers started to talk between them; they began to show their presentations to each other. This situation caused a little noise in the classroom. I had to warn those students to be more silent and sit down to their own chairs.” The researcher asked that “whether this ‘finishing early’ situation occurred in 4B, too”. The teacher responded that

“Yes, this was occurred in both 4A and 4B sections. Because, in every grade level and class there are pupils who are familiar with computers, they have experience with other kinds of software. Therefore, this is usual to see such pupils. It is similar to that in a math course there can be some students that add, multiply, divide and calculate and solve some problems quicker than the others. The computer course is not an exception. [T-8]”

The Overview and Discussion of the Lessons

First, the researcher focused on the situation that some students finished their presentations earlier than the others. The researcher asked that “was this situation created a classroom management problem, or made a high level of distraction for other students?” The teacher stated that

“If I speak openly, this situation occurs frequently in any of my grade levels or classes. This situation cannot be classified as a problem. You should think that in a math course some students solve a problem quicker than the others as I exemplified earlier. In fact, the math course has a disadvantage considering slow solvers, in a math course when a couple of students solve a problem and the math teacher sees this, the math teacher starts to demonstrate the solution of the problem. The other students (slow solvers) stop dealing with the problem and watch the teacher; because, the math teacher shows the solution of the problem. In a math or physics course you cannot see, or say it’s rare, a teacher individually helping/solving a problem with a student. However, in a computer course most of the time you can see a computer teacher individually helping/guiding a student. The students also know this advantage that if s/he having a problem the teacher is there for helping/guiding her/him. Moreover, in our case there was the OLE which also shows the steps of a task. Therefore, a student knows that when s/he forgets some steps, there is an information source that s/he can get help. [T-9]”

The teacher stated that in the third week, students were going to prepare a presentation according to a topic they choose. The teacher noted that “at the end of the lesson I reminded my students about the presentation they were going to prepare. I told to them that they should choose a presentation topic for the next lesson”. The researcher interrupted and stated that “I guess it would be better to repeat the

concepts readability and visual design at the beginning of the lesson. Because, you had told to me that students, most of the time, didn't pay attention to such points". The researcher and the teacher agreed that at the beginning of the course the teacher was going to mention about these concepts again. Moreover, the teacher was going to show two presentations, one is well-designed and the other is not good enough to read text and differentiate images.

The researcher also pointed out that many of the students, probably, will not come to the class with a topic. Therefore, the teacher should have various topics to assign to those who don't choose any topic. The researcher and the teacher agreed on the following alternative topics; (1) global warming, (2) a TV show they like, (3) a cinema movie, (4) a city (might be hometown), (5) M. Kemal Atatürk, (6) their summer vocation, (7) air pollution, (8) a country they want to see, (9) an artist they like and (10) a singer. The teacher asked that most of the time male pupils prefer presenting the football team they support or a computer game they play often, so should we let them to choose such topics or not. The researcher stated that if there were going to be too many presentations about a football team or a computer game it would be boring to follow same kind of presentations. Therefore, if it would be possible letting only a couple of students to choose such topics seems to be appropriate. If there are too many demands then the teacher is going to draw lots.

The teacher also noted that in the subsequent week the students are going to present their presentations to the class. The teacher asked that "should I mention about the evaluation form that they are going to evaluate each other's performance or not?" The teacher and the researcher agreed that the teacher is going to mention about the evaluation and possible criteria of the evaluation so that students should give the necessary attention to their presentations.

4.1.1.4. Results of 4A – I3 and 4B – I3

The students expected to prepare a PowerPoint presentation about a topic they chose. They are required to follow visual design rules (text-background contrast, choosing appropriate slide design, etc.) and enrich their presentations with pictures and clipart images. They are going to present their presentations to the class in the next week.

How was the Lesson Carried Out?

The teacher stated that at the beginning of the lesson he told to the students that they were going to prepare a presentation in today's lesson. He pointed out that they didn't pay enough attention to visual design of their presentations in the previous lesson. The teacher showed two different presentations to his students, underlined some slides which were difficult to read text and some other slides which were difficult to differentiate pictures. The teacher indicated that "I told about visual design concepts will be a criterion in evaluating their presentations". The teacher also reminded the students about that their text should be grammatically correct.

Afterwards, the teacher told to the class "last week I reminded you about that you should come to this lesson with a presentation topic in mind. Those of you who came with a presentation topic raise your hands so that I can write your names and your topic". The teacher wrote down the names and topics of the students. The other students drew their topics from the alternative topic list of the teacher. The teacher stated that he assigned each topic to students. There were three male students who preferred a football team and one boy chose a basketball team, two girls chose singers, and a boy chose a computer game. The other students chose topics such as TV show, a city, M. Kemal Atatürk and other topics from the teachers list.

After distribution of topics were finished the students started to prepare their presentations. The teacher stated that "at the beginning, I reminded my students to frequently save their works". The teacher told to the class that they can use Google to find information about their subject and find pictures. The teacher stated that "I told

to them that at least in one slide they have to use clipart image”. The teacher stated that they began to research on the Internet about their subjects and they downloaded various images from the internet. The teacher expressed that

“I was around to observe their actions, help if they need. I also recommended that they can refer to the OLE when they forget how to do something. [T-10]”

The students continued developing their presentation to the end of the lesson. The teacher indicated that “before the lesson ended, there were three students who stated that they didn’t finish their presentation, yet. I checked those students and saw that they were very close to finishing their presentations. They were undecided about where to place pictures, or whether to change their slide designs again or not. I told to them that I was going to collect the presentations so they have approximately ten minutes to finalize their work.” The teacher stated that “I told to the class to save their work, again and wait for me to copy their presentation into my flash disk. The students whose work had been saved into the teacher’s flash disk can leave the classroom”.

The Teacher’s Notes

The teacher stated that one of his students wanted to learn how to add an MP3 into his presentation. The teacher indicated that “I demonstrated to the student how to insert a sound file into a slide. However, some other students who realized that one of their friends had an MP3 inserted into a slide; they wanted to learn how to do that. I figured out that I was going to have to demonstrate to every student, so I spoke aloud to the class that now I am going show how to insert a MP3 file to a slide, if you want you can take notes during my demonstration. I will not demonstrate it again”. The teacher stated that I clearly told to the class that inserting an MP3 file into a slide is an optional work to do. In other words they didn’t have to insert a sound into their slides.

The teacher noted that “there were only four or six students who used the OLE while preparing their presentations. Most of the students were able to complete their presentations without any help from me or the OLE. There were three students who frequently asked to me about whether the information they placed into a slide was enough, or whether the image was appropriately placed, or whether the choice of colors were appropriate or not. Mostly their questions were not technical, but related to the content and visual design of their presentations.”

The Teacher’s Perceptions about Students

The teacher stated that in today’s lesson hours his students were concentrated on preparing their presentations. The teacher expressed that when students are given the option of choosing their topic, they are more engaged to the task given. Therefore, he stated that instead of giving the same topic to every student, he prefers his students to choose their topics. He stated that

“I observed that most of the students were comfortable using the presentation software. They didn’t have many problems while preparing their presentations. Most of the students were able to finish their presentations without any help needed. Some of the students referred to the OLE to remember the steps. Some other asked my help. [T-11]”

The Problems Faced During Implementation

The teacher indicated that one of his students wanted to prepare a presentation about a popular TV series, which is about mafia. The teacher stated that “of course, I didn’t let the student to prepare a presentation on that topic. What is more interesting is that, after hearing this topic two other students immediately wanted to choose that topic, too. My students know my characteristic that when I told to them ‘impossible’ then they know that there is no way of agreement on that subject.” The teacher assigned the topic ‘global warming’ to the student who proposed that TV series.

The teacher indicated that in 4A section, one student’s computer was not connected to the Internet. He stated that he checked the cabling of the computer and he figured

out that there was problem with the connection of RJ45 jack and the cables. He stated that he always has a couple of reserved cable. However, he indicated that “I slightly pushed cables into the RJ45 to fit them into the jack. It worked, so I didn’t have to change the whole cable.”

The Overview and Discussion of the Lessons

The teacher and the researcher overviewed today’s lessons. The teacher stated that the lesson was implemented as he expected. He stated that lessons with such activities, if students are interested, take the attention of students. The teacher indicated that “if we ignore the minor problems, which were a topic about a mafia TV series and an Internet connection problem of one computer, there were no other unexpected situation”. The teacher told to the researcher that “next week students are going to present their presentations, I need to prepare a peer evaluation form”. The researcher reminded that “there is an evaluation form in the teacher’s book of the course and the OLE”. The teacher told that the evaluation form in the book was specific to evaluating a presentation about a TV show and needs to be updated for covering various kinds of topics. The teacher took the responsibility of updating the peer evaluation form and printing as many as needed. The teacher and the researcher agreed that, (1) at the beginning of the next lesson the teacher will talk to the students that they are going to present their presentation as planned, (2) they are going to be informed about the peer evaluation form that they are going to evaluate their friends, (3) a student presents his/her presentation, (4) a short time for peer evaluation and discussion, and another student presents.

4.1.1.5. Results of 4A – I4 and 4B – I4

In the last week of the implementation the students were required to present their presentations. The final learning gains of the unit “4.3.5.Share his/her presentation with his/her friends” was aimed to be achieved.

How was the Lesson Carried Out?

The teacher stated that he had printed out the evaluation form that was going to be distributed to the students. At the beginning of the lesson the teacher told to the students that

“Today, you are going to present your topics. If you remember, last week I collected your files from your computers. I saved the files to my computer so that you can present your presentation via projector. We can start with volunteers. Is there anyone who wants to present? [T-12]”

He indicated that instead of starting the presentations by following a sequence of sorted student IDs or student names, he preferred starting with volunteers. The teacher expressed that he informed his students about the evaluation form that they were going to evaluate their friend’s presentation according to the criteria in the evaluation form. The evaluation form was consisted of 8 items which were: (1) text in the slides were grammatically correct, (2) the subject was covered well-enough, (3) there were pictures and figures (clipart), (4) the pictures were related to topic, (5) slide design was applied to slides, (6) text were readable, (7) slide design was appropriate and (8) the presenter presented good. Moreover, each item has three points: (1) very good, (2) good, (3) needs to be improved.

The teacher stated that they started the presentations with one male volunteer whose topic was about a football team. The teacher indicated that “each student was required to come to the teacher’s computer and open his/her document and start his/her slide show.” The teacher identified that the presentation session was conducted as planned. Each student presented his/her presentation, others were evaluated the presenter and a short discussion about the topic and the presentation was conducted. The teacher indicated that the above process took approximately six to nine minutes for one student. At the end of the second lesson hour, the teacher collected the evaluation forms and told to the class that “he is going to announce the results of the peer evaluation forms next week.”

The Teacher's Notes

The teacher expressed that he also mentioned about importance of the concepts like eye-contact, adjusting the volume of voice and interaction between the presenter and the listeners so that they can have criteria evaluating a presenter's performance. The teacher stated that most of the students were easily handled the presentation process. He noted that five of the students (two in 4A and three in 4B) were excited too much or shamed which caused them to read the text in the slides as fast as they can.

The teacher explained that the students already did their work last week. Therefore, in today's lesson hours other than the excitement of presenting they were comfortable.

The teacher stated that he developed the peer evaluation form by using the course book and the evaluation form exists in the OLE. The teacher explained that, the evaluation form in the course book was specific to a topic of TV show. However, he assigned different topics to students. The evaluation form in the OLE was more generic but needed to be improved. Therefore, by investigating the two, he created his version of the peer evaluation form.

The Teacher's Perceptions about Students

The teacher stated that most of the students were excited more or less, as expected. He told to the presenters that the listeners are their friends and it's only a five minutes presentation and nothing else. Moreover, he stated that "I told them that other subject area teachers might want them to prepare homework or project and present in the classroom. Therefore, it is a good chance for you to practice here in the computer course". The teacher indicated that his students liked today's activity too much. He observed that a couple of students were in the mood of a real presentation. They asked to speak and commented on the topic or asked questions to the presenter.

The Problems Faced During Implementation

The teacher indicated that there were no problems during the lesson hours. He mentioned that in section 4B, at the end of the first lesson I shutdown the projector because it gets heated over time. At the beginning of the second lesson hour, I saw two students trying to open the projector. I warned them to be careful and showed how to open the projector. The teacher wanted to note that at the beginning of the semester he already introduced the equipments in the laboratory.

The Overview and Discussion of the Lessons

The teacher expressed that the unit-3 was finished for grade-4. He claimed that “my experiences show that students like PowerPoint than other office programs. This is because, I guess, they feel themselves freer”. In today’s lesson there wasn’t a need to use the OLE. However, he as a teacher benefited from the OLE for preparing the peer evaluation form. Moreover, he stated that next week he was going to use some questions provided in the OLE to summarize the unit-3. He explained that next week he was going to summarize the units of the whole semester. The researcher reminded the teacher for announcing the results of the peer evaluation form.

4.1.2. Results of 6A

4.1.2.1. General Information About the Curriculum of 6A

The basic information about the curriculum of section 6A followed by the computer teacher is explained here. The computer teacher followed Level-6 (Intermediate Level) curriculum. There were two sections of grade-6, but the sections followed different units of the curriculum during the implementation. The implemented unit was “Unit-3: Presenting my information”. Table 4.2 presents the implemented curriculum of grade-6 for the section A. It is worth to note that in section-A there were too many students that two students had to share a computer. In other words, there were two students per computer which is a common situation in many of the

schools in Turkey. Unlike grade-4 curriculum which has two lesson hours in a week, grade-6 curriculum has one lesson hour in a week.

Table 4.2: The Implemented Curriculum of 6A

Curriculum Feature	Details
Level	6 (advanced)
Unit	3 – Presenting my information
Learning gains (level.unit.learning- gain)	6.3.1. Add and use hyperlinks and time settings for preparing effective presentations 6.3.2. Can prepare a multimedia presentation that provides links between pages/slides 6.3.3. Can present multimedia projects in an effective way 6.3.4. Become aware of that media messages are edited
Lesson hours	1 hour in a week
Unit duration	5 hours

4.1.2.2. Results of 6A – II

The first lesson hour of 6A aimed to achieve learning gains “6.3.1.Add and use hyperlinks and time settings for preparing effective presentations” and “6.3.2.Can prepare a multimedia presentation that provides links between pages/slides”.

How was the Lesson Carried Out?

The teacher expressed that he asked to the class about whether they remember the concepts presentation, PowerPoint and slide at the beginning of the lesson. The teacher indicated that “according to the answers provided by the students, I provided the formal definitions of the terms. Therefore, my students can remember the concepts. I showed them a presentation example available in the course CD”. The

example was a presentation titled as “Our Life Source: Water”. The presentation consisted of 20 slides categorized under four headings. The teacher expressed that he explained why we can need links/hyperlinks and adjusting time for automatic transition between slides. He stated that

“By demonstrating over the example, I showed them the difficulty of moving back to the content slide, or moving forward to a desired heading from the content slide without hyperlinks and after I showed them how easy it is with hyperlinks. [T-13]”

The teacher stated that, after, I told to them that “they are going to study in groups of two. I explained that one student in a group will be in the role of a teacher and the other will be the learner. The teacher-student is going to study the steps of adding hyperlinks and adjusting automatic slide transitions, after s/he is going to teach his computer-mate to how to do steps”. He stated that he told to the teacher-students that they are going to download and use the presentation provided in the OLE. The teacher expressed that he told to the class that they should speak with a lower tone so that there isn't too much noise in the lab.

The teacher stated that his teacher-students started to study from the OLE. The teacher indicated that “I gave five minutes to the teachers to study”. While teacher-students were studying the teacher made a short meeting with learner-students. The teacher indicated that he told to the learners that they should evaluate their teacher-students' performance. The teacher told that

“After the time was up, the learner-students went to their computer-mates. The teacher-students, started to teach their friends. It was a funny experience for me to watch them in the role of a teacher. Hearing teacher-students' comments such as ‘my teacher, he don't want to understand’, or ‘he does not listen to me’, or ‘she is doing wrong’. [T-14]”

The teacher stated that he observed that most of the groups were seriously did the activity with a good level of concentration. He stated that at the end of the lesson he told to the learner-students to reveal their evaluation scores for their teachers. The

teacher just chose a teacher-student with a high score to teach/demonstrate in front of the class by using the teacher's computer and projector. The teacher indicated that, afterwards, he showed that there are some ready buttons used in moving between slides. He stated that he showed the action buttons: next, previous, home and end. At the end of the lesson the teacher explained to the students that next week they are going to prepare a presentation about a world-wide famous musician. The students were required to make some research about a musician, they like, before the next lesson hour.

The Teacher's Notes

The researcher asked about the noise in the lab. The teacher answered that

“You know that my first consideration was noise, but I didn't feel disturbed by the noise. It was higher than a normal lesson but lower than my expectation. I rarely needed to tell to the class that they should be quieter. [T-15]”

The teacher stated that most of the students didn't like the idea of timely automatic transitions between slides. The teacher revealed that he agrees with the students that other than some specific situations adjusting time for automatic slide transition is not a commonly used property. The teacher noted that when he mentioned about links/hyperlinks the students first thought about giving links to web pages. The teacher explained to his students that there is another option of giving hyperlinks to a slide within a presentation.

Last, the teacher noted that at the end of the lesson he showed the action buttons, but intentionally, he didn't explain that the students can duplicate and use the buttons in other slides by copying-pasting. He stated that “I know that they are going to discover by the next lesson, if they don't I will tell them”.

The Teacher's Perceptions about Students

The teacher expressed that most of the students were participated to the activity with high motivation. The teacher observed that many of the students adopted the roles given to them. On the other hand, there were two groups that didn't like the activity much. The teacher-students in these groups demonstrated to their computer-mates as fast as they can without enough explanation. Interestingly, the learner-students didn't complain about this. Their common aim was just finishing what was required from them. The teacher told that he dealt with those groups to participate to the activity in a serious way. The teacher stated that there were some teacher-students that were taking notes or writing the sequence of steps from the OLE. The teacher stated that "when I saw a student who was writing the steps, I told to the teacher-students that while they are teaching to their friends they are free to switch to the OLE and check their knowledge".

The Problems Faced During Implementation

The teacher stated that at the beginning he didn't sure about the timing of the lesson. He explained that at the beginning of the lesson, he spent approximately nine or ten minutes for reminding the presentation terms and for showing a sample presentation. He stated that, after he spared five minutes to teacher-students to study their lessons. He continued "at this point I was not sure that whether five minutes could be enough or not. Moreover, there was another phase of the lesson that they are going to teach the subject to their friends, how much time would it take?" He stated that students were able to finish the teaching/learning process and completed their five slides presentation approximately in ten minutes. He revealed that after that he was sure that everything was going to go well. He stated that after a three or four minutes of a student's demonstration via projector, he had enough time to finalize the lesson by showing the action buttons and a lesson summary.

The Overview and Discussion of the Lessons

Before the implementation of grade-6 the teacher informed the researcher about that there was going to be two students per computer. The researcher asked that “how were you conducting lessons and handling classroom management, previously?” The teacher explained that he demonstrates, after first group of students practiced the second group was using the computers. Both the researcher and the teacher knew that such situation is not an ideal teaching/learning environment. However, they also knew that this is the situation in many of the public schools. They stopped discussing the current situation of computer laboratories in Turkey and concentrated on how to implement the lessons in such condition. The researcher proposed a strategy that is assigning teacher role to one student and learner role to another student which can be a solution to actively involve both students sitting in front of a computer. The first thought that came to the teacher’s mind was that it would be a very noisy environment. The teacher stated that

“Even in a normal lecture hour conducting a lesson with more than 25 students was a trouble. Now, we are trying to have them speaking to each other. I can’t even imagine the loud noise in the lab. [T-16]”

The researcher explained that “you can direct your students-in teacher role- to the OLE, which shows how to do the steps of adding hyperlinks and adjusting time settings for automatic transitions. Afterwards, the teacher-students can demonstrate the procedures to their ‘computer-mates’”. The teacher stated that “I like the teaching/learning method you explained, as I said my only consideration is noise. I guess I can handle the situation manage the classroom”.

Finally, the teacher and the researcher agreed to implement the lesson on the basis of assigning roles (teacher/learner) to the computer-mate students. At the beginning of the lesson, the teacher is going to show a presentation that has hyperlinks between slides and slide transitions are automatically adjusted. Afterwards, the teacher-students are going to study the subject and steps from the OLE; afterwards each of

them is going to try to teach to his/her friends. The teacher-students are going to use the presentation (with five slides) provided in the OLE. A teacher-student is going to download and open the presentation and demonstrate the steps to his/her friend by using that presentation. At the end of the lesson the teacher will choose one group to show their experience to the whole class.

The teacher explained that the implementation of this new teaching/learning strategy was a different experience for him. He stated that

“I have been teaching to some crowded classes for years but I didn’t think of such a strategy before. I am thinking to use such a strategy or a variation of it with my other classes. [T-17]”

However, the researcher reminded that he told about time consideration he had during the lesson. The teacher answered that

“Yes, close to middle of the lesson I thought whether the time will be enough or not. However, obviously this was because I had no experience of such kind of lesson before. Therefore, it’s a normal consideration. [T-18]”

The teacher reminded that next week students are going to prepare presentation about a musician and in the subsequent week they are going to present their presentations. The researcher asked that “they are going to prepare the presentation in groups, aren’t they?” The teacher answered that “previous semesters, I conducted this lesson with a group working. So we can follow a similar method”. The teacher explained that

“Similar to today’s lesson I can assign roles to the students in two phases. In the first phase they can research about a musician they chose, in the second phase they can prepare their presentations. Considering a group, one student can use the computer to search information and find pictures and the other student can write down the information they have. In the second phase they start to prepare their presentation; one student can use the computer to add new slide and enter text, and the other can tell the information or remind about pictures they have. [T-19]”

The researcher agreed the teacher's idea. They concluded that the teacher is going to present the lesson activity. Afterwards, the students are going to search for information and prepare their presentations. The researcher noted that the teacher can provide the list of links to the related demonstrations in the OLE. The researcher listed that: 6.3.1, 6.3.3, 5.5.3, 4.3.2 and 4.3.3 can be provided to the students so that they can reach demonstrations of various steps for PowerPoint.

4.1.2.3. Results of 6A – I2

The second lesson also focuses the learning gains “6.3.1.Add and use hyperlinks and time settings for preparing effective presentations” and “6.3.2.Can prepare a multimedia presentation that provides links between pages/slides”.

How was the Lesson Carried Out?

The teacher expressed that at the beginning of the lesson he introduced the lesson activity to the class. The students were going to prepare a presentation about a famous musician. The teacher told to the class that

“Today, you are going to prepare a presentation about a musician you like. You are going to work in groups similar to last week. As a group your task is to search information and some materials which can be pictures, music like an MP3 file, or a short video. Afterwards, you are going to prepare your presentations. You are expected to finish your presentations in today's lesson hour. Next week you are going to present your presentations. [T-20]”

The teacher indicated that he explained the evaluation criteria for their presentations. The evaluation criteria were present in the ‘Study Book’ under the heading of ‘A Musician’. The teacher indicated that he told the students that they must have a slide listing the references they used.

The teacher stated that other than the shortcut links (to the related units and learning gains of the OLE) exists in the favorites of computers, he also wrote on the board the address of 5.3.3 learning gains of the OLE. Therefore, the students can watch a

demonstration about 'how to do something in PowerPoint'. The shortcut links to other learning gains were already present under their favorites' menu item of their browsers.

The teacher explained that he had three kinds of student groups. First group of students were already had determined a musician and made some home-search before coming to the class. The teacher expressed that there was no problem with the first kind of groups. Second group of students were the ones who didn't choose a musician to present. The teacher indicated that he assigned musicians (such as İdil Biret, Fazıl Say, Pavarotti, Hadise and Mozart, and so on) to those students. The third kind of students was the groups having discussion with their computer-mates to choose which musician to present because both computer-mates had chosen different musicians to present. The teacher indicated that he told to them to present both musicians.

The teacher expressed that nearly all of the students finished preparing their presentations before the lesson ends. The teacher explained that, his students had no difficulty in completing the activity of the lesson. The teacher indicated that there were two groups who wanted to finish their presentation at home. He stated that he let those students. He indicated that he collected/saved the documents from computers to his flash disk for to be ready for their presentation in the next lesson.

The Teacher's Notes

The teacher stated that one of the students asked that "do we have to do the tasks separately? Can't we start preparing our presentation while collecting information over the Internet?" The teacher explained that I let those groups who wanted to prepare their presentations by simultaneously researching for information and preparing their presentations.

The researcher asked that whether the teacher observed any student or group who referred to the OLE while they preparing their presentations for the purpose of

learning some steps. The teacher explained that there were only two groups, as far as he saw, referred to the OLE for the purpose of watching the demonstration of giving custom animation. The teacher indicated that many of the students asked to him when they had a problem. The teacher told that

“I didn’t tell them to look at the OLE which provides the answer rather I answered their questions because showing the action took relative short time than watching from the OLE. Moreover, I observed that many of them helped each other. For example, one student from one group went to other groups to learn about how they achieved giving custom animation to a picture. He learned to give custom animation, and explained to his computer-mate. [T-21]”

The teacher added that many of them also used Google to learn how to do a procedure in PowerPoint.

The Teacher’s Perceptions about Students

The teacher indicated that “as I expected the students learned to copy and paste action buttons. Indeed, one student told to the class that they can copy and paste action buttons or link buttons to other slides. A very fast spread of knowledge was happened”. The researcher asked the reason behind this situation. The teacher explained that

“There are always a few students with a well experience with computers and can use computers or learn to use some programs/actions very quickly. Therefore, when they find how to do something or an interesting solution to a problem they immediately share with this knowledge with their friends. Honestly, I have to say that this kind of sharing is not for the purpose of a gentle sharing of information rather the behavior is a kind of show off. In other words such students want to show that they knew the subject or they learn quicker. [T-22]”

An example to this situation was explained by the teacher that “one student added an MP3 file to his presentation and showed to the class that he has an MP3 file playing in his slide. Of course, some other students wanted to learn how he accomplished

that”. The teacher indicated that based on his experience in such situations a student with the knowledge shares most of the time, interestingly.

The Problems Faced During Implementation

The teacher indicated no major problems considering the implementation of the lesson. He summarized the lesson hour that at the beginning he had some students who didn't decide/choose a musician to present. He explained that he assigned a musician to these students but some of them didn't like the musician (for example, Pavarotti) they were assigned. The teacher explained that he told to those that they were supposed to decide a musician to present and come to the class with that idea. The teacher indicated that during the lesson hour there were some students asking how to complete a procedure in PowerPoint or some others asking whether the information or pictures they collected enough or not. There were a few students who didn't finish their presentations at the end of the lesson. The teacher concluded that these are situations occurs in nearly every lesson hour and can't be classified as problems.

The Overview and Discussion of the Lessons

The researcher told the teacher that he summarized lesson already during the problems faced part. The researcher continued that he wanted to ask about the evaluation criteria for the presentations. The teacher reminded that in the 'Study Book' there are evaluation criteria for this lesson. He detailed that the evaluation criteria items are: (1) there must a button (action button or another button) that provides link to the main slide, (2) There should be an exit button in the last slide, (3) slides must be enriched by pictures and images that are appropriate with the content, (4) there should be animations in slides, (5) there must be an example of a musician's work of art, (6) the presentation must include at least six slides, (7) There must be a list of content slide which must also have links to other slides. The teacher stated that he added a last item which requires students to give reference to the sources. The

teacher indicated that he added another criterion that the first slide, namely title slide, must have the names of students who prepared the presentation.

The teacher stated that next lesson students are going to present their presentations. The teacher detailed that he always mentions about some strategies about presenting at the beginning of the lesson. He continued that he is going to mention about the importance of eye-contact, voice tone and interaction with the listeners at the beginning of the lesson. He noted that for each presentation he will use the evaluation criteria to evaluate his students.

4.1.2.4. Results of 6A – I3

The lesson aimed to achieve the learning gains “6.3.3. Can present multimedia projects in an effective way” and “BTESD-12 can give reference to the materials which are copyrighted and/or public”.

How was the Lesson Carried Out?

The teacher indicated that before the lesson hour, he organized the students’ presentation files to the teacher’s computer. The teacher expressed that at the beginning of the lesson he told students that they are going to present their presentations about a musician they prepared last week. The teacher explained the evaluation criteria again, and he continued with the importance of effective presentation strategies eye-contact, voice tone, interaction with listeners, explaining or providing examples to support slide information and etc. He noted that he started with volunteers and a presentation was presented by a group of students who shares the same computer.

He indicated that he didn’t interrupt during a presentation session; rather he preferred a short discussion as a whole class after a presentation about the presentation and strategies used during presenting. The teacher explained that as a class they had small discussions after each presentation. He asked to the class that whether they

were impressed by the presentation, whether the presentation was fluent, whether the presenters used presentation strategies, and etc. so that his students can be aware of the importance of presenting in an effective way.

The teacher summarized the lesson hour that the students as groups presented their presentations; they did a discussion after each presentation to reveal missing points of the presentation and presenting.

The Teacher's Notes

The teacher indicated that in the OLE there should be information about ways of or strategies of effective presentation considering this unit. He explained that if there were existed such information he could direct his students to the OLE, and prepare a list of criteria for effective presentation and afterwards they could use these evaluation criteria to evaluate each other. Moreover, the evaluation criteria for evaluating presentation could be provided in the OLE. In conclusion he expressed that for this unit there were not enough examples and sources provided by the OLE.

The Teacher's Perceptions about Students

The teacher explained that presentation activities always have two kinds of students. The first group of students are the ones who want (or desire) to present voluntarily with a high motivation. The second group of students hesitates or get excited to be in front of their friends. The teacher explained that in such situations he also tried to be involved in the presenting process to calm down those students. He indicate that he learned from his experiences that in such situations teacher involvement makes the excited student to feel that 'yes, the teacher is with me, no problem can occur'. The teacher summarized that he is used to overcome such situations.

The Problems Faced During Implementation

The teacher indicated that close to the end of the lesson, he noticed that there were six groups to present but there was not enough time all of them to present. He

indicated that after that they didn't made any discussions after a presentation to save time. The teacher revealed that one group was not able to present within the time limits of the lesson hour, but the group was showed (not presented) their presentation to the class in the break time.

The teacher expressed that with two groups the discussion between the presenters and the class became a quarrel. In other words, the presenters didn't welcome to the criticisms made by the class. The teacher noted that he interrupted and explained the importance of criticism and how the presenters should behave in such situations.

The Overview and Discussion of the Lessons

The teacher explained that today's lesson hour was a familiar presentation session for him. The researcher asked that "how would we integrate the OLE to such presentation lessons?" The teacher explained that

"There can be a page for students to evaluate the presenters online. For example, listeners can give scores to the presenters and at the end of the lesson best presenters can be chosen. [T-23]"

The researcher interrupted that "however, as you can guess, there must be a standard evaluation form, or a dynamic evaluation form that a teacher can build and enter the items". The teacher and the researcher agreed that it would be a good property of the OLE.

The teacher indicated that next lesson is going to be about media and how media communicates the news with the readers, the importance of some factors that affect communication of messages. He revealed that he investigated the related learning gains of the OLE and he didn't satisfied. He explained that the OLE consisted of providing book knowledge considering this learning gain. He stated that he uses an in-class activity for this learning gain. He detailed that he shows three messages about the same incident/event from different newspaper. Afterwards, as a class they discuss how the messages are presented in different newspapers. They discuss about the terms objectivity, role of media, importance of media, reality and so on. The

teacher suddenly indicated that “before you tell, I should note that I am aware of that the lesson topic is difficult because it can lead to a classroom discussion about politics. Therefore, I choose news like health, environment, technology, or rarely sports”. The researcher agreed and supported the idea of choosing topics similar to the teacher listed.

4.1.2.5. Results of 6A – 14

The final lesson hour of this unit focused on the learning gain “6.3.4. Become aware of that media messages are edited”. The learning gain focuses on the importance of role of media, objectivity and subjectivity of media, how media messages differ from newspaper to newspaper.

How was the Lesson Carried Out?

The teacher explained the implementation of the lesson hour that first he introduced the students with the lesson topic that they are going to discuss about media. Afterwards, the teacher distributed three different printouts; each of the printout presents the same news from different perspectives. The teacher explained that he printed out the examples from the course book. He told his students to read the news carefully because they are going to present to their class-mates about the content of the news.

The teacher expressed that he chose different students to present their news. The teacher indicated that they presented their news from according to the perspective provided by the content they had. He stated that the news they had were about the same event, but the newspapers presented the news from different perspectives. The teacher indicated that he opened the discussion with “which news is correct, how do we know which to trust, how can we evaluate the quality of news”. He explained that after the discussion he provided an event to his students to prepare news that is as objective as possible. At the end of the lesson the students read their news and they discussed about the factors related to presentation of news.

The Teacher's Notes

The teacher stated that there was nothing happened that can be classified as extreme or unusual to explain. The researcher asked that whether the discussion moved to some politics or religious points. The teacher answered that some students gave politic examples from what they probably heard from their parents. The teacher explained that most of the time he listened to these students however he didn't let a detailed discussion about that subject.

The Teacher's Perceptions about Students

The teacher indicated that students were actively involved in the activity because a discussion environment is generally preferred by the students. He indicated that in order to make the subject clearer he generally gives an example from football. He explained that because they are supporters of different teams. Therefore, their perceptions about an event differ radically from each other. The teacher summarized that by providing such examples his students can be aware of the factors (such as subjectivity and objectivity) related the lesson topic.

The Problems Faced During Implementation

The teacher stated that he observed no problems during the implementation of the lesson except that some noise or students' interruption of each other during discussions. The teacher explained that he believes that the debates they watch from the television have an effect on their perceptions about discussion. Therefore, I many of the times list rules for the discussion such as not to interrupt the speaker. The teacher finalized that his role is not to teach only a subject but also to teach about some social behaviors like how to discuss or debate.

The Overview and Discussion of the Lessons

The teacher explained that the information provided in the OLE was much detailed and complex. The teacher clearly stated that "information would be much simple and

plain”. He continued that he didn’t integrate the OLE with this lesson hour because the in class activity and classroom discussion take the attention of students much more. Therefore, he advocated that such activities are best implemented with discussion of the subject with the teacher’s guidance. Therefore, reading from a book, or the OLE cannot substitute the impact of in-class discussion considering such topics. He noted that he benefited from the OLE for gaining a different perspective about the lesson subject. He explained that previously he didn’t mention about the processes of how news are prepared. He told that he explained to process to his students, too. Moreover, he used the evaluation questions provided by the OLE that at the end of the lesson while he was summarizing the lesson, he asked some of the questions provided by the OLE.

4.1.3. Results of 6B

4.1.3.1. General Information About the Curriculum of 6B

The basic information about the grade-6 curriculum for section B followed by the computer teacher is explained here. The computer teacher followed Level-6 (Intermediate Level) curriculum. Section 6B followed a different unit when compared to section 6A. The implemented unit was “Unit-4: Introducing my School”. Table 4.3 presents the implemented curriculum of grade-6 for the section B. Similar to section A there were two students per computer. Unlike grade-4 curriculum which has two lesson hours in a week, grade-6 curriculum has one lesson hour in a week.

Table 4.3: The Implemented Curriculum of 6B

Curriculum Feature	Details
Level	6 (advanced)
Unit	4 – Introducing my School
Learning gains (level.unit.learning- gain)	6.4.1. Realize that various newspapers create different page styles based on basic design principles. 6.4.2. Realize the importance of visual literacy 6.4.3. Interpret visuals from a critical point of view 6.4.4. Use the basic properties of desktop publishing
Lesson hours	1 hour in a week
Unit duration	8 hours (4 hours implemented)

4.1.3.2. Results of 6B – II

The first lesson hour of 6B aimed to achieve the learning gain “6.4.1. Realize that various newspapers create different page styles based on basic design principles”. The learning gain focuses on properties of a well-designed page and visual hierarchy, consistency, balance, color and spacing properties of a page.

How was the Lesson Carried Out?

The teacher indicated that in the previous lesson he told his students to bring newspapers or magazines they like and study the lesson from the OLE. The teacher explained that he printed out the web page address of the related learning gains page and distributed to the students in the previous lesson. At the beginning of the lesson the teacher explained to the students that they are going to learn about design principles and related concepts. The teacher stated that he asked to the class that how many of them already studied the subject from the OLE. The teacher indicated that nearly half of the students didn’t study the subject topic before the lesson hour. So he decided to direct his students to related learning gains page of the OLE in order to study the lesson topic and concepts. After the students studied the subject for

approximately ten minutes the teacher started a discussion about the concepts. The teacher indicated that the discussion was about the importance of the visual hierarchy, balance (text and image), color (text and background contrast and importance of font color in terms of readability) and importance of spacing.

After the discussion the teacher indicated that he chose a couple of computer-mates to present the newspaper or magazine they brought. First the computer-mates explained the design principles applied in their example (newspaper or magazine), after as a class they critically evaluated the design of the example. While a group presenting, the teacher wrote the related design principles to the blackboard. The teacher explained that there were too many newspapers and most of them were the same. Therefore, he presented some magazines (about computer technology, nature and science) and they discussed the design of these magazines and compared their designs. The teacher indicated that at the end of the lesson he made a short quiz based on the evaluation questions provided in the OLE.

The Teacher's Notes

The teacher indicated that as he stated, nearly half of the students didn't study the lesson topic from the OLE. He explained that he spared some time for those to study the subject topic in the lesson hour so that they can also participate to the discussion. The teacher informally indicated that most of the students brought newspapers rather than magazines. He indicated that most of the students do not have the habit of reading magazines. Therefore, he brought some magazines to the classroom so that they can discuss design principles from a different perspective than newspaper.

The Teacher's Perceptions about Students

The teacher explained that more than half of the students had studied the lesson topic before the lesson hour. He indicated that when he told to the class, at the beginning of the lesson, that they were going to study the subject topic from the OLE, those students who already studied before the lesson were disappointed. The teacher

explained that “however, I told to the class that this was an exception and they will not have a chance to study the subject hour during the lesson hour for the future lessons”. The teacher stated that he adopted such a strategy to increase the participation to the discussion.

The Problems Faced During Implementation

The teacher explained that they didn't have any problems using the OLE. The teacher stated that he had comments and suggestions considering the related learning gains page of the OLE in terms of content. These comments and suggestions were explained under the below heading.

The Overview and Discussion of the Lessons

The teacher indicated that the OLE should have more examples related to the learning gain. He stated that the OLE could provide both good and bad design examples. The teacher detailed that in such cases when the students were required to come to the class with some examples (in this case newspapers or magazines), most of the time many of the students forget bringing, or they had the same example. Therefore, the teacher should be prepared for such situations or the sources (course book or supplementary sources like the OLE) should provide examples for a teacher. The teacher finalized that course resources such as books, teacher CDs, or supplementary web pages should have various, and sometimes alternative materials for a teacher so that a teacher can focus much on implementation of a lesson. The researcher asked that whether the teacher expects a teacher's resources section similar to teacher's book or materials should be accessible to all students. The teacher indicated that both options can be used. The teacher exemplified that one teacher can prefer focusing on one or two examples or materials whereas another teacher can show all examples. The teacher also noticed that a teacher can select examples or other materials to be shown in a related page to the students. The teacher summarized his thoughts that he actually come to the point that such learning

environments can be customizable in terms of content and materials so that a teacher can use such an environment according to his/her teaching-learning strategies.

4.1.3.3. Results of 6B – I2

The second lesson hour of 6B aimed to achieve the learning gain “6.4.2. Realize the importance of visual literacy”. The learning gain aims to emphasize importance of symbols, communication and visual literacy.

How was the Lesson Carried Out?

The teacher explained that he started the lesson by introducing some symbols to the students and asking about these symbols’ meanings. The teacher stated that he showed well-known symbols such as ‘18+’ or ‘13+’ or ‘no ironing’, etc. He told that “there are some symbols which are very familiar to the students and the students know their meanings. Starting with such well-known symbols, students thought that they know all the symbols. However, when I showed them a different symbol they try to guess its meaning. This guessing process was both interesting and enjoyable for them”. The teacher stated that he showed another symbol, which was presented in the advertisement movie as a part of the learning gain page in the OLE. The teacher explained that his students tried to guess the meaning of the symbol. The teacher told that there are a couple of students whose guesses were close to the meaning of the symbol. Afterwards, the teacher stated that he showed the video which reveals the meaning of the symbol via his projector.

The teacher continued that after guessing section he directed his students to the OLE so that, afterwards, they can have a discussion about the importance of visual literacy and symbols afterwards. The teacher detailed the discussion process that, as a class they focused mainly on the importance of international communication with symbols and understanding the necessity of visuals and symbols. The teacher finalized that at the end of the lesson he assigned homework for the next lesson. The students were

required to find at least three symbols that are different from the symbols presented in the lesson hour.

The Teacher's Notes

The teacher expressed that his students were familiar with many of the symbols presented in the OLE. He claimed that there could be some symbols that were interesting and not well-known so that students can become aware of that there are too many symbols. He explained that his students were overviewed the lesson content from the OLE in a very short time. On the other hand, he stressed that the movie and the symbol in the movie were matched very well with the lesson learning gains.

The Teacher's Perceptions about Students

The teacher explained that the lecture was interesting and enjoyable for the students. He told that

“When a lesson topic is something related with real life students involved with the lesson and discussion much than usual. In other words, I can say that that students like the subject topics about which they have something to tell. [T-24]”

The teacher finalized that the lecture hour was both effective and enjoyable for the class and the students were participated to the discussion session.

The Problems Faced During Implementation

The teacher indicated that there wasn't a problem related to the lecture. However, he noted that he re-installed a computer's operating system previous day. He explained that one computer's operating system was crashed so previous day he re-installed the operating system again.

The Overview and Discussion of the Lessons

The teacher stressed that the advertisement movie in the OLE was attracted all of the students attention than he was expected. The teacher indicated that “I thought that many of them already had watched the advertisement movie on TV. However, I realized that many of them didn’t remember the movie, and most of them didn’t watch it before”. The teacher explained that the movie was very good in terms of taking attention of students and matches very well with the learning gains of the unit.

The researcher informed that next week they were going to study about visuals and design issues. The teacher stated that the subject topic is about evaluating and interpreting the quality visuals and multimedia. He continued that he has some alternative visuals and presentations to show and discuss about them. The teacher reminded that some of the concepts were similar to 4.3.1 learning gain which was also covers some design issues.

4.1.3.4. Results of 6B – I3

The learning gain “6.4.3. Interpret visuals from a critical point of view” was the aim of the lesson. Similar to 6.4.1 learning gain, this learning gain also covers design issues, especially multimedia design issues, color consistency, placement of objects (text and images) and use of appropriate music or movie.

How was the Lesson Carried Out?

The teacher told that he started with reminding the first lesson (6.4.1) of the unit, which was about properties of a well-designed page and visual hierarchy, consistency, balance, color and spacing properties of a page in terms of newspapers, magazines or advertisements. He continued that after the remediation session, he started explaining the design issues considering multimedia. The teacher explained that he showed two different presentations about animals, both including pictures and text, from course CD. The teacher continued that they started the discussion about

the design differences between two presentations. The teacher expressed that this warm up discussion carried with an informal discussion style that is his students only stated their ideas about the visual appearance of the presentation. Afterwards, the teacher stated that in order to have his students learning about how to criticize formally he directed his students to the OLE, which had a video (3 min 23 seconds) criticizing two different posters, one was well-designed and the other was bad. The video criticize posters according to the design concepts therefore rationalizing the criticism this is what the teacher meant by formal discussion style. The teacher told that he aimed to have their next discussion with higher quality. The teacher stated that he requested from students to critically comment on design of the presentations. Moreover, he underlined that the students had to rationale their criticism by using or referring to the design concepts such as color balance, spacing, visual hierarchy or consistency and so on.

The teacher stated that after the students watched the OLE movie, he presented two different presentations which had sound in addition to text and images. The teacher explained that he again opened the discussion by telling students to evaluate the quality of presentation in terms of design issues. The teacher detailed that one of the presentation, which was about advertising Turkey, the sound used was a foreign rock music. He explained that in such a presentation a cultural music sound would be better and he expected his students to notice that point. He told that “however, until I asked them did you like the music, nobody mentioned about the music. After my question, they guessed that something wrong with the music and we discussed about the music”. The teacher told that at the end of the lesson he distributed a short quiz. He stated that he used the questions provided in the evaluation page of the OLE.

The Teacher's Notes

The teacher explained the formal and informal discussion terms in response to the researcher's question. The teacher explained that he meant rationalizing a criticism for using formal discussion style. In other words, he stated that while an informal discussion session students mostly respond like ‘I liked the colors used, or pictures

were good, and so on'. On the other hand, when formal discussion style was followed his students were required to state that whether the background color and text color provide enough contrast for clear readability, whether pictures are placed good so that text is readable and enough white space is provided for visually, or whether a music (sound) used is appropriate with presentation content or multimedia project. The teacher continued that he wanted his students to rationale their ideas/comments. In other words, he told that "think of that there are two students, one stating that s/he liked colors and the other saying that s/he didn't liked the colors. One student should rationale that the colors used were appropriate because they provide enough contrast and therefore the text is clearly readable. Therefore, your comment that you didn't like the colors is subjective".

The Teacher's Perceptions about Students

The teacher explained that his students were familiar to the subject from the first lesson of the unit. Therefore, his students understood the subject easily. The teacher continued that he preferred a classroom discussion for explaining the content because he wanted his students to differentiate objective and subjective criticism. He detailed that students at this age mainly state their ideas according to whether they liked it or not. However, criticizing requires rationalizing the comments and suggestions therefore, he wanted his students to have the habit of providing reasons for their criticisms and suggestions. The teacher explained that after the first relatively short discussion session he required his students to provide reasons for their criticism rather than whether they liked or not. He exemplified that a couple of students adopted the formal discussion style that they commented their friends' criticisms for the requirement of rationalizing their criticisms. The teacher stated that for this learning gain, learning about criticism was as important as learning about visual design principles.

The Problems Faced During Implementation

The teacher expressed that there was no problems during the implementation. He explained that he didn't have technical problems during the lesson hours generally. Moreover, he stated that he had no problems for connecting to the OLE and showing the pages of the OLE.

The Overview and Discussion of the Lessons

The teacher explained that he didn't direct his students to the OLE for evaluation because there are two students per computer. He expressed that when two students answer at the front of a computer most of the time one student answers the questions and the other only follows. Therefore, in such crowded classes, he usually preferred distributing the questions on paper.

He stated that the content in the OLE was good to provide enough information for the students. Especially, he liked the movie that criticizes two different posters (one is well-designed and the other is bad). He stated that his students became aware of the importance of rationalizing their comments and ideas. He summarized that providing much information does not guarantee having students who learned much. However, providing enough examples helps teacher to enrich sources that can be presented in classroom. Therefore, he believed that most of the time he preferred referring to the examples, animations or movies of the OLE. The researcher asked that whether there shouldn't be any content explanation. The teacher answered that he didn't mean that, and he strongly recommend that there should be content explanation. He exemplified that in his other classes he also benefitted from the content explanation of the OLE both for him and for his students to study. He stated, as a conclusion, that he didn't mean removing any part of the OLE, rather he found implementation page of the OLE much useful both for him and his students. He also stated that he was very much benefitted from the evaluation page for preparing short quizzes.

The teacher informed the researcher about next week's lesson that he was going to start basics of desktop publishing. He stated that he was used use MS-Publisher as desktop publishing software, but the OLE provides Adobe-Photoshop. Moreover, the teacher stated that in this laboratory Adobe Photoshop software was not installed. He explained that he is going to use MS-Publisher as he used to teach. Therefore, he revealed that he was not going to use the implementation page of the OLE, but he was going to use Information Share (content explanation) page and evaluation page of the OLE.

4.1.3.5. Results of 6B – I4

The last lesson of the implementation aimed to achieve learning gain “6.4.4.Use the basic properties of desktop publishing”. The lesson focuses on use of MS-Publisher for desktop publishing, especially use of design gallery objects, margins, guide lines, grouping, rotating and ordering properties of MS-Publisher.

How was the Lesson Carried Out?

The teacher stated that he started the lesson by explaining his students what they learned up to this lesson and what they were going to learn. He told his students that they were going to prepare brochure. He expressed that he showed the brochure example available in the Course CD. The teacher explained to his students that they were going to decide content of their brochure. The teacher stated that they were going to study in groups because an organization requires cooperative working of people.

Afterwards, the teacher demonstrated the basics of MS-Publisher software via projector. He explained that after the demonstration he required his students to decide on subject of their brochure. The teacher required his students to start by paper based rough design of their brochure. The teacher explained that he also required his students to have a school logo or picture in their brochure.

The teacher expressed that his students started preparing their projects and he helped to those students having problems about completing a task. The teacher explained that he first required his students to decide the content of their brochure, rough design of their brochure. Afterwards the students can prepare their brochure by using MS-Publisher. The teacher revealed that this activity is a two week activity therefore, he required his students to pay attention to their content and design. The teacher stated that at the end of the lesson he warned his students for saving their work because that they were going to continue their work next week.

The Teacher's Notes

The teacher expressed that the lesson hour was a traditional lesson hour both for him and his students. He even noted that one of his students asked whether they were not use the OLE. The teacher explained that he was conducted the lesson as he used to teach.

The Teacher's Perceptions about Students

The teacher explained that his students watched his demonstration about MS-Publisher. He revealed that with this section his students didn't use the OLE for watching demonstrations of doing steps of software. The teacher explained that "for example grade 4 students watched the demonstrations from the OLE, they know that when they forget something to do, they can refer to the OLE. However, grade 6 students were benefitted from the OLE for watching movie examples. Therefore, they didn't feel any lack of property considering the OLE". The teacher tried to explain that grade 6 students were not used to use the OLE for demonstration purposes.

The Problems Faced During Implementation

The teacher expressed that they didn't have any technical problems during the implementation. He stressed that the most important problem for this learning gain was the demonstration provided by the OLE. He explained that the OLE provided the

demonstration of Adobe Photoshop for desktop publishing, however he was used to use MS-Publisher and even Adobe Photoshop was not installed. The teacher clearly indicated that he cannot state whether this situation can be classified as a problem or not. He explained that if the OLE was my course web site instead of my supplementary web site, this situation could be classified as a problem. Similarly, a support site [the OLE] for his course should also provide appropriate content for him.

The Overview and Discussion of the Lessons

The researcher asked that if he had the chance of teaching about Adobe Photoshop whether he prefers use of Adobe Photoshop or MS-Publisher. The teacher answered that he would prefer MS-Publisher because he thinks that learning MS-Publisher is easier than Adobe Photoshop. Moreover, he claims that his students are much familiar with Microsoft software therefore he prefers use of MS-Publisher. The teacher stated that next week he was going to continue with MS-Publisher as he was used to.

4.1.4. Results of 7A

4.1.4.1. General Information About the Curriculum of 7A

The basic information about the curriculum for section 7A followed by the computer teacher is explained here. The computer teacher followed Level-7 (Intermediate Level) curriculum. The implemented unit was “Unit-2: Comparing my Calculations”. The unit focuses on use of spreadsheets. In detail, use of formulas, creating charts and use of logical operators (IF formula) and conditional formatting were explained. The teacher finished the learning gain 7.2.1 in the previous lessons. Therefore the implementation covers learning gains 7.2.2., 7.2.3 and 7.2.4. Table 4.4 presents the implemented curriculum of grade-7 for the section A. Grade-7 curriculum has one lesson hour in a week.

Table 4.4: The Implemented Curriculum of 7A

Curriculum Feature	Details
Level	7 (advanced)
Unit	2 – Comparing my Calculations
Learning gains (level.unit.learning- gain)	7.2.1. Solve various problems by using formulas in spreadsheets (implemented in previous lessons) 7.2.2. Solve various problems by using charts in spreadsheets 7.2.3. Use appropriate logical operators for doing logical comparisons 7.2.4. Do conditional formatting in spreadsheets.
Lesson hours	1 hour in a week
Unit duration	7 hours (3 hours implemented)

4.1.4.2. Results of 7A – II

The first lesson hour of 7A aimed to achieve the learning gain “7.2.2. Solve various problems by using charts in spreadsheets”. The learning gain focuses on how to select chart area, creating chart for presenting information and chart types.

How was the Lesson Carried Out?

The teacher explained the flow of the lesson that at the beginning of the lesson he showed his students various kinds of examples about charts. The teacher explained that he intended to describe the situations where numerical information and charts are needed. Therefore, his students could be aware of the importance of using information technologies. The teacher continued to explain that after the short discussion of spreadsheets and charts, he showed a spreadsheet example to the class via projector. He explained that he demonstrated the steps of preparing labels/headings, entering data for the related fields, selecting the appropriate data and headings/labels and creating charts. The teacher explained that the example he used was present in students’ study book. Therefore, after his demonstration the students

can prepare their spreadsheet document by using the data provided in their study book. He also noted that he explained and demonstrated different kinds of chart types, but he stressed that they were going to use column chart type for their charts.

The teacher expressed that in 7A section he informed his students about that the demonstration of how to add chart into a spreadsheet which was provided in the OLE so that they can refer to the OLE when they needed. The teacher detailed that his students started to create their spreadsheet documents by entering data. Afterwards, they started to insert charts into their documents. The teacher noted that his students had difficulty in selecting the chart area. He detailed that some students only selected the numerical data area which resulted 'series' and '1, 2...' labels instead of headings of the data area in their chart. Similarly, some other students selected only one heading area which resulted in missing labels in their chart. The teacher explained that he demonstrated the selection process and stressed the importance of selecting headings of the data areas.

At the end of the lesson he directed his students to the OLE in terms of evaluation. He stated that he asked his students to answer the short quiz (four items were present) provided in the OLE. The teacher detailed that after two minutes; he showed and answered the quiz questions via projector.

The Teacher's Notes

The teacher noted that his students had difficulty in selecting data area for chart. He explained that selecting the headings of the data area affects how the chart is created considering labels of the chart. Therefore, he re-demonstrated how to select chart data and headings.

The Teacher's Perceptions about Students

The teacher explained that his students in this section were able to easily create charts. The teacher detailed that at his grade most of the students were much familiar with computers. He stated that "moreover, at this grade or higher grades, students do

not hesitate or fear trying menu options of software. For example, many of the students created different chart types, too. Some of the students appropriately use the undo option; even some of them use the shortcut key for undoing. Therefore, such students usually prefer ‘trial and error’ strategy. If they are not able to find a solution they ask.

The Problems Faced During Implementation

The teacher indicated that he didn’t face a technical problem during the implementation. However, he stated that as he noted, the demonstration in the OLE was showing the selection step in a different way, which caused him to explain and demonstrate the selection step once more.

The Overview and Discussion of the Lessons

The teacher informed the researcher about the students’ selection problem. He detailed that after the lesson he re-watched the demonstration in the OLE. He explained that he realized that the demonstration in the OLE was also showing the selection steps in an inappropriate way. He detailed that the demonstration was not wrong, but in the demonstration one heading for the data area was not selected therefore the resulting chart was including ‘1, 2, 3, ...’ labels for the vertical data. The teacher explained that when the headings are not selected MS-Excel automatically places ‘series1, series2, ...’ labels or a numbering ‘1, 2, ...’ labels for headings. On the other hand, when data headings are selected, MS-Excel places the data headings as labels for the chart. He stated that some of his students, who followed the demonstration provided in the OLE, therefore didn’t select the heading cells for their chart.

4.1.4.3. Results of 7A – I2

The second lesson of 7A focused on “7.2.3. Use appropriate logical operators for doing logical comparisons”. This learning gain aims to achieve using “IF” formula,

use of logical operators such as “=”, “>”, “>=”, “<” and “<=”. Students are expected to use IF formula for making comparisons.

How was the Lesson Carried Out?

The teacher stated that he provided real life examples to his students where IF situations are used. The teacher stated that the most clear IF example they understand was “pass” or “fail” situation. The teacher provided the example that was if a student’s exam result is below 44, fails; otherwise passes. The teacher continued that he explained the basic rule of IF formula to his students by writing the algorithm of the formula which was “If a student’s exam result is below 44; fails; otherwise passes”. The teacher explained that before providing direct IF formula he provided the algorithm of the formula. He detailed that, by this way students can understand the basic logic behind using the IF formula better. The teacher explained that at the first 15 minutes he provided different kind of examples and requested his students to provide IF algorithms for the situations.

He continued that after discussing the logic of IF formula, he demonstrated how to use IF formula in Excel. He stated that he used the same pass or fail example to demonstrate. He explained that at the beginning he demonstrated how to write the whole IF formula, afterwards he requested his students to write the IF formula. He stated that he provided another if example to his students and requested them to write the IF formula by themselves. The teacher detailed that he helped to the students who had difficulties in writing the IF formula.

The teacher made a short verbal quiz before the end of the lesson. He explained that he asked the questions provided by the OLE. He revealed that nearly half of the students gave wrong answers or no answer to the questions. The teacher stated that at the end of the lesson he assigned homework to his students from the OLE. He explained that he told his students to complete and write the IF formula using the data set provided by the OLE. Moreover, the teacher assigned his students to study

the next week's topic from the OLE. The next week students were going to be doing conditional formatting in Excel.

The Teacher's Notes

The teacher noted that his students had difficulty in understanding the logic of writing IF formula. He continued that if you gave them the syntax of the IF formula they able to write. However, when you change the situation or change the example, they often fail to write the correct formula. He supported his views by stressing that in previous years, he had also similar situations with other classes. He explained that

“...therefore, I wanted to explain the subject topic. Because I knew that my students would have difficulty in understanding the logic of IF formula. I tried to explain the logic by giving examples and discussion of the IF algorithm so that students could understand the basic logic behind the IF formula. [T-25]”

The Teacher's Perceptions about Students

The teacher explained two different perspectives about his students. He stated that he had two kind of groups of students; the first group actively interested and understood the IF formula and the second group had difficulty in understanding the IF formula. The teacher told that

“...this is a normal situation; I knew that some of the students would have difficulty in understanding the subject topic because the nature of the topic is relatively difficult. Therefore, I wanted to explain the subject topic rather than directing my students to the OLE. When the subject topic is related to doing an action for software, students can easily follow the demonstrations and explanations of the OLE. On the other hand, when the task requires students to progress a mental process like IF formula, students need to ask questions and according to my answers and directions students try to understand the logic. [T-26]”

The Problems Faced During Implementation

The teacher didn't use the OLE for the implementation of the lesson. Therefore, he had nothing to state about the OLE implementation. Moreover, he indicated that he had no problems considering classroom management issues.

The Overview and Discussion of the Lessons

The teacher explained that this learning gain is generally difficult for students, considering his previous experiences. Therefore, he stated that he was going to explain the subject topic by demonstrating to the students. The researcher asked that "what is the difference between his demonstration and the OLE?" The teacher clearly stated that when the students study such topics which require much mental process students need someone (teacher) to ask and satisfy with the answer so that students can understand the topic. The teacher explained that if his students would use the OLE for this learning gain they would surely complete the task given to them, but they would not going to understand the use of IF formula. He continued that "I am sure that when I give them another situation that requires use of IF condition they will fail to write the correct IF formula". Therefore, the teacher decided to explain the topic with his methods and he stated that he was going to give homework from the data set provided by the OLE.

The teacher wanted to state that "I guess most of the students will not do the homework assignment and will not study the subject topic from the OLE." The explained that most of the time, many of the students usually do not do homework assignments. Therefore, he asked what strategy he is going to do. The researcher and the teacher agreed that the teacher is going to assign the subject topic as an in-class activity.

4.1.4.4. Results of 7A – I3

The last laboratory session of the 7A grade aimed to achieve the learning gain “7.2.4. Do conditional formatting in spreadsheets”. When compared to IF formula conditional formatting is easier to accomplish because conditional formatting does not require students to write formula. Conditional formatting requires students to select condition and select the desired format option.

How was the Lesson Carried Out?

The teacher explained that at the beginning of the lesson he checked students’ homework, which was assigned last week. After, he stated that he asked his students “whether they studied today’s lesson topic from the OLE or not?” He clarified that more than half of the students didn’t study the subject topic from the OLE. The teacher told his students that they have 10 minutes to study the lesson topic from the OLE. Moreover, he told his students that they “are going explain the subject to the class by using the projector.” The teacher explained that his students watched the demonstration provided by the OLE and they did the OLE activity. After the self-study session the teacher chose one student to explain the subject topic to his friends using the projector. The teacher stated that he guided the student explaining the conditional formatting.

Close to the end of the lesson the teacher requested his students to do the activity in their study book. The students enter the data, which was about “where to sky?”, provided in their study book and do a conditional formatting explained by the activity. The teacher explained that to the end of the lesson his students tried to do the activity and he helped to the students who needed.

The Teacher’s Notes

The teacher stated that most of the students didn’t do the homework assignment. Moreover, most of the students didn’t study the assigned subject topic from the OLE. Therefore, the students were required to study the subject topic at the beginning of

the lesson hour. He also noted that close to half of the students also needed his help during the self-study session. Therefore, he helped those students to do the task. He explained that some of the students had difficulties in selection of the appropriate cells, and some others had difficulties in choosing the appropriate condition criteria. Therefore, he helped some of the students who had above difficulties.

The Teacher's Perceptions about Students

First, the teacher stated about the homework assignment which was not completed about many of the students and they neither studied the subject topic from the OLE. On the other hand, as an in-class activity most of his students tried to study the subject topic from the OLE. The teacher explained that in-class activities are more beneficial for the students because they know that when they have problems they can ask to the teacher.

The Problems Faced During Implementation

The teacher explained that he had no problems during the lesson hour in terms of classroom management and technical. He noted that one of his students who tried to study the subject topic from the OLE didn't able to open the flash animation, which was about conditional formatting. The teacher stated that

“I guess my student didn't have flash program installed in his computer, or it could be kind of software problem, because when I learned about this, I asked some other students whether they had similar problems or not. The other students told me that they were able to watch the flash animation. [T-27]”

The Overview and Discussion of the Lessons

The teacher summarized again that many of the students didn't do the assignments given to them. On the other hand, nearly all of the students completed the in-class activity from the OLE. The teacher also noted that when compared to the IF formula, conditional formatting is relatively easier. Therefore, more than half of the students had no difficulty in completing the task. The teacher continued that the animation of

the OLE was very well-prepared; thereby students were able to follow it easily. Other students requested help or explanation from the teacher about selection of appropriate cells and deciding the correct conditioning.

4.1.5. Results of 7B and 7C

4.1.5.1. General Information About the Curriculum of 7B and 7C

The basic information about the grade-7 curriculum for section B and C followed by the computer teacher is explained here. The computer teacher followed Level-7 (Intermediate Level) curriculum. The implemented unit was “Unit-2: Comparing my Calculations”. The Unit focuses on use of spreadsheets. In detail, use of formulas, creating charts and use of logical operators (IF formula) and conditional formatting were explained. Table 4.5 presents the implemented curriculum of grade-7 for the section B and C. Grade-7 curriculum has one lesson hour in a week.

Table 4.5: The Implemented Curriculum of 7B and 7C

Curriculum Feature	Details
Level	7 (advanced)
Unit	2 – Comparing my Calculations
Learning gains (level.unit.learning- gain)	7.2.1. Solve various problems by using formulas in spreadsheets (not implemented) 7.2.2. Solve various problems by using charts in spreadsheets 7.2.3. Use appropriate logical operators for doing logical comparisons 7.2.4. Do conditional formatting in spreadsheets.
Lesson hours	1 hour in a week
Unit duration	7 hours (3 hours implemented)

Although the followed curriculum were the same for 7A, 7B and 7C, the results of 7B and 7C sections are presented separately because in 7B and 7C sections a different teaching learning strategy is followed. The teacher and the researcher agreed to implement the laboratory session based on students' pre-study. In other words, students were assigned to study next week's lesson topic from the OLE before coming to the laboratory session. Therefore, the results of 7B and 7C were presented separately.

4.1.5.2. Results of 7B – II and 7C – II

The first lesson hour of 7B and 7C aimed to achieve the learning gain “7.2.2. Solve various problems by using charts in spreadsheets”. The learning gain focuses on how to select chart area, creating chart for presenting information and chart types. The students were expected to study the lesson topic at home and come to the class prepared.

How was the Lesson Carried Out?

The teacher stated that he asked to the class whether they had studied the subject topic from the OLE or not. The teacher revealed that nearly half of the students didn't do the assignment given last week. The teacher expressed that he warned those students who didn't study. He explained that he made it clear that for the next week he was not going to help those students who didn't study their assignments.

The teacher told to the class that they were going to have an assignment for this laboratory session. He explained that he was going to help those students who didn't study before coming to the class only for this laboratory session. He underlined that next week they must come to the class having studied the given assignment.

The teacher stated that he explained the in-class activity to the students. After, he gave time to his students to finish the activity. During the students doing their activity, the teacher helped to the students who had difficulties in completing the

activity. At the end of the laboratory session, the teacher summarized the activity, demonstrated the steps of inserting charts again to the classroom.

The Teacher's Notes

The teacher noted that, close to half of the students didn't study subject topic at their home. Therefore, he helped those students only for this week. The teacher pointed that "we can see what will be the situation next week". The teacher stated that he gave permission to the students in section 7B to help each other. The teacher explained that, in 7B section there were some students who are very interested in computers. Those students requested the teacher's permission to help their friends. The teacher gave permission to those students who desire to help their friends. The teacher stated that he explained rules to his students that one student can help one other student, no much noise is allowed. The teacher expressed that he also stated that any time they can ask questions to him. Moreover, he underlined that they have to study for the next week.

The Teacher's Perceptions about Students

The teacher explained that those students who didn't studied at their home, naturally had difficulties in completing the activity. Therefore, he had to demonstrate to those students. The teacher stated that

"I guess next week most of them will come to class having studied their assignment because they were aware of that without studying at home they obviously have problems in doing the in-class activity, too. [T-28]"

The teacher explained the situation in section 7B that

"I gave permission to some of the students to help their friends, because in 7C section in this morning I had difficulties in helping to the students individually. Therefore, I preferred to demonstrate to the class similar to my traditional lessons. However, in 7B section when the students requested permission to help their friends, I thought that I can help to the remaining students. [T-29]"

The teacher finalized that his students were aware of the situation that they are also responsible for their learning. He claimed that most of the students will come to the next lesson by studying the lesson topic from the OLE.

The Problems Faced During Implementation

The teacher stated that there *were not technical problems* during the implementation. He reminded about the students' situation that some of the students didn't study their assignments before coming to the lesson. The teacher expressed that this situation cannot be classified as a problem. He also reminded students request at the section 7B.

The Overview and Discussion of the Lessons

The teacher and the researcher, before the implementation of this unit for these grades, discussed about the teaching/learning strategy. They agreed that the students were going to study the subject from the OLE at home. After the end of the each laboratory session the teacher assigned next week's lesson topic to the class. The last week the teacher assigned the learning gain "7.2.2. Solve various problems by using charts in spreadsheets".

The teacher and the researcher expected that students would have at least some questions in their mind, or would become familiar with the software. On the other hand, the teacher also reminded that many of the students would come to the class without self-studying. The teacher and the researcher decided that no additional time in laboratory hour would be given to those students who didn't study. However, they can ask or request help from the teacher only this week. For the following week they had to study the subject topic from the OLE before coming to the class. During the laboratory session the teacher was going to give an assignment to the class and the students were told that this assignment was going to be graded.

4.1.5.3. Results of 7B – I2 and 7C – I2

The second lessons of 7B and 7C focused on “7.2.3. Use appropriate logical operators for doing logical comparisons”. This learning gain aims to achieve using “IF” formula, use of logical operators such as “=”, “>”, “>=”, “<” and “<=”. Students are expected to use IF formula for making comparisons.

How was the Lesson Carried Out?

The teacher started to the lesson by asking to the class that how many of them studied the assignment from the OLE. The teacher stated that many of the students studied their assignment. However, many of the students stated that they didn’t understand the use of IF formula. The teacher, like he normally does, explained the IF formula to his students. He provided examples that aims to explain the logic of IF formula, he provided the syntax of the IF formula and demonstrated how to implement the IF formula using Excel.

The teacher stated that after his explanation and demonstration he provided a different scenario which require use of IF formula for his students. The teacher told that “I assigned another activity for them, so that they can practice the IF formula and if they still have questions they can ask”. At the end laboratory session the teacher assigned the next week’s assignment. He reminded his students that they have to study before coming to the next week’s laboratory session.

The Teacher’s Notes

The teacher explained that more than half of the students did the assignment before coming to the laboratory session. The teacher detailed that “As I guessed more students did their assignments when compared to last week”. On the other hand, the teacher noted that many of the students stated that they didn’t understand the lesson. He stated that one of his students told him “my teacher, I did study the lesson topic from the site and I did the application in the site, but I didn’t understand why we use EĞER (IF) command, when we use EĞER command”. The teacher revealed that

“Actually, this subject, I mean IF formula is a difficult subject to understand. Therefore, students need to ask questions. Moreover, IF formula is not only about writing the correct syntax but also understanding the logic of using IF formula is important. [T-30]”

The teacher concluded that some subjects like IF formula requires students to understand the logic. The teacher detailed that

“For example, learning about how to insert chart is relatively easier when compared to IF formula. In order to insert a chart a student is only required to select appropriate cells and go to insert menu and choose one of the chart types. On the other hand, IF formula requires students to think about test criteria and consequently action depending on the result of the criteria. In other words, inserting a chart only requires selecting and clicking appropriate cells and menus, but IF formula requires a mental process and use of correct syntax. [T-31]”

The Teacher’s Perceptions about Students

The teacher explained that when compared to previous week his students came to the class much prepared. In other words, after previous week, his students studied their assignment from the OLE for current week’s lesson. The teacher continued that “as I mentioned just a moment ago, some of the students in section 7B, requested my permission for letting them to help their friends. I permitted them that they can help their friends so that I can help some other students”. The teacher continued that his students were aware of their responsibility that they need to study in order to understand and accomplish in-class activities.

The Problems Faced During Implementation

The teacher reported no technical problems related to the implementation of the laboratory. He just reminded the points that, again there are a couple of students that didn’t study before coming to the laboratory session.

The Overview and Discussion of the Lessons

The teacher stated that he explained the IF formula by providing real life examples so that his students can understand the logic of IF formula. He expressed that he explained the basic algorithm of if formula. The teacher mentioned that he provided the example pass or fail situation. The teacher stated that he explained IF condition “if a student’s exam result is lower than 44; the student fails; otherwise the student passes”. The teacher explained that by providing such a familiar example students understand the logic of using IF formula. He claimed that then demonstrating the use of IF formula with appropriate syntax gets easier both for me and for his students.

The teacher wanted to state again that “if the subject topic is relatively difficult then students have difficulties in building the logic. In other words, for difficult topics, they need the presence of a teacher who can explain the topic to them in a detailed way. The teacher can provide various examples according to the level of students. Let me give an example, in section 7B students are much interested in computers and therefore they understand the subject topic easier than 7C. In section 7C I gave more examples to the students in order to make the subject clearer”.

4.1.5.4. Results of 7B – I3 and 7C – I3

The last laboratory sessions of the 7B and 7C grades aimed to achieve the learning gain “7.2.4. Do conditional formatting in spreadsheets.” When compared to IF formula conditional formatting is easier to accomplish because conditional formatting does not require students to write formula. Conditional formatting requires students to select condition and select the desired format option.

How was the Lesson Carried Out?

The teacher stated that he asked to the students “does anyone want to teach and demonstrate today’s topic”. The teacher indicated that two students volunteered. The teacher noted that in section 7B there were more students volunteered. The teacher

explained that “I was also there to interrupt when it’s necessary to give additional information and examples”. The teacher continued that

“The student started to demonstrate immediately. However, there had to be an introduction session, when do we use conditional formatting, why do we need such a function. Therefore, I interrupted the student and asked these questions to the class. I also provided two examples which can also support their visual sense. [T-32]”

After the discussion of why conditional formatting was needed, the teacher let the student to demonstrate the steps of conditional formatting. The teacher stated that he presented another scenario to the class so that he can observe whether they were doing well or not, whether they have any problems or not. He mentioned that in both sections there was couple of students who were having difficulties in choosing the appropriate condition.

The Teacher’s Notes

The teacher noted that most of his students, in both sections, came to the laboratory having studied their assignment. The teacher explained that he asked to the students how did they studied from the OLE. He stated that his students gave almost a common answer “I watched the demonstration and tried to do it”. The teacher explained that usually students don’t read the explanation parts; they want to watch and do. The teacher indicated that

“It didn’t matter whether the students studied the topic at their home or not, I felt that I had to explain the subject to the students. Because I believed that without my explanations they couldn’t able to understand the logic behind the topic. I wanted them to know in which situations they can use conditional formatting, the steps of doing conditional formatting was relatively easier. On the other hand, deciding when to use conditional formatting is much important. Because of this reason I wanted to explain and discuss the topic so that I can be sure that my students understood the big picture. [T-33]”

The Teacher's Perceptions about Students

The teacher indicated that especially in section 7B, his students were more interested in the subject; therefore, more students in this section desire to be involved actively in class activities. The teacher explained the situation of these students that “I believe they studied much at home so that they can show off in the class. I guess it’s because of that they wanted to help their friends”.

The Problems Faced During Implementation

The teacher indicated that he had no problems during the implementation. On the other hand he noted that two of his students told him that they weren’t able to connect to the OLE at their home. The teacher stated that he asked some other students whether they did also had the same problem. The teacher revealed that only those two students had the problem. The teacher reminded that another student had the problem that she didn’t able to watch the flash animation demonstrating the steps of conditional formatting.

The Overview and Discussion of the Lessons

The teacher stated that when compared to the previous lessons this lesson was much efficient. The teacher indicated that, especially, last week’s subject topic (IF formula) was also a difficult subject to explain and understand. On the other hand, this week’s topic was relatively easier to understand and implement. The teacher wanted to compare two lesson topics. He stated that “if the subject topic is difficult, I mean requiring understanding of a concept or logic such as IF formula, students need more explanations and examples and therefore, practice. On the other hand when the topic is relatively simpler, the students can understand and implement the topic easier”. The teacher summarized that when the subject matter is difficult, directing students to OLE for pre-study is not as effective as when the subject is relatively easier. He explained it that for difficult topics he had to explain and provide examples as he

normally does. On the other hand when the topic is relatively easier, he claimed that he didn't have to provide too many detailed explanations and demonstrations.

4.1.6. Overlapping Utilization Patterns

This section summarizes the teacher's utilization of the online learning environment and the overlapping utilization patterns. First of all the overlapping elements that constitutes the teacher's instruction is explained. The elements are examples, discussions, demonstrations, evaluation, content explanations, and activities. Table 4.6 shows the elements of the teacher's instruction and related teacher actions.

The teacher used examples to for variety of instructional purposes. The examples were used to explain the subject topic in detail, to differentiate two concepts or terms, to explain subject topic, to introduce a new concept, to concrete some abstract. Discussion sessions were aimed to have students with constructed understanding. In other words discussions aimed to enable students to gain a kind of self-perspective and understand the perspectives of other students so that an individual student can build or construct his/her understanding. There were times that a discussion session was a kind of question and answer style of communication. However, most of the time, the students interacted with each other during a discussion session. Demonstrations were the mainly used to show steps of performing an action for software. Demonstrations were provided by the teacher or by the online learning environment. The teacher preferred the demonstrations provided by the OLE and directed the students to the OLE demonstrations. The teacher evaluated his students' progress at the end of a learning gain or at the end of a unit. The teacher used different kinds of evaluation. For example, paper-based quizzes, online quizzes that were provided by the OLE, evaluation forms which aimed to evaluate a product developed by a student, peer evaluation forms which aimed to have students evaluating their friends. Content explanations were mainly performed by the teacher. Content explanations included explanation of terms, concepts, definitions, and so on. The teacher when compared to other elements used the online learning environment

less for content explanation purposes. However, the teacher sometimes used the online learning environment to introduce the subject topic to the students. Students involved in activities to produce some products or documents during the lesson hours. The aim of the computer course is to teach students how to perform some operations of software. Therefore the teacher mainly assigned tasks to the students. The teacher used activities provided by the OLE and the course book. While doing activities the students benefited from the OLE mainly in terms of content explanations and demonstrations.

Table 4.6: The Teacher's Overlapping Elements of Instruction

Elements	Actions or Excerpts
Examples	4A-I2, 4B-I2: The teacher showed two different presentations to his students. Each presentation had different slide designs and the slides of the presentation were enriched by pictures.
Discussions	4A-I1, 4B-I1: The teacher and students discussed about the differences between the two documents and the aims of the documents
Demonstrations	4A-I1, 4B-I1: The teacher directed his students to the OLE in order to have them watching the short video (2 minutes 30 seconds) demonstrating how to open the PowerPoint program, how to add new slide, how to prepare a title slide, how to add text to new slides and how to show presentation (slide show).
Evaluation	4A-I1, 4B-I1: The teacher showed the related evaluation page of the OLE.
Activities	The students continued to enrich their presentations
Content Explanations	6A-I1: "I provided the formal definitions of the terms. Therefore, my students can remember the concepts."
Activities	4A-I1, 4B-I1: Teacher requested his students to study individually and investigate the two documents and provide answers to the given questions.

4.1.6.1. Enablers of Using the Online Learning Environment

The online learning environment enabled the teacher to (i) spare more time for dealing with students individually, (ii) provide another information source for students, (iii) increase students' motivation and interest to the lesson. Table 4.7 presents the overlapping enablers and related actions or excerpts.

Table 4.7: The Overlapping Enablers

Enabler	Actions or Excerpts
Spare more time for dealing with students individually	T-1: when I directed my students to the OLE, which actually demonstrates instead of me, I had two kinds of student groups, ones who can watch the demonstration and perform the task without a problem, and others having problems with performing the task given. Therefore, I had time for individually guide these students. Therefore, I was able to help each student without making other students wait.
Provide another information source for students	T-9: Moreover, in our case there was the OLE which also shows the steps of a task. Therefore, a student knows that when s/he forgets some steps, there is an information source that s/he can get help. T-7: I guess that, students knew that they didn't have anything to miss. In other words, they know that they were always able to refer to the OLE when they need.
Increase students' motivation and interest to the lesson	the advertisement movie in the OLE was attracted all of the students' attention than he was expected.... the movie was very good in terms of taking attention of students and matches very well with the learning gains of the unit

4.1.6.2. Methods and Strategies Used During Integration Process

Assigning a task (activity) and discussions were frequently used by the teacher during the integration of the online learning environment. The implementation of lessons indicated that the computer teacher assigned tasks for students in many of the lessons. With discussions, as explained before, the students are expected to gain self-perspective and discuss their perspectives and gain an understanding of others views towards constructing an understanding about a topic. Table 4.8 below presents the methods/strategies used by the computer education teacher during integration process.

Table 4.8: The Overlapping Strategies Used During Integration Process

Strategy	Actions or Excerpts
Assigning a task (activity)	4A-I1, 4B-I1: The teacher told that everyone was required to prepare a short presentation about them. 4A-I2, 4B-I2: The teacher told to the students that “you are going to add pictures to your presentation and change the design of your presentation... 7A-I3: The teacher explained that his students watched the demonstration provided by the OLE and they did the OLE activity.
Discussions	6A-I3: The teacher preferred a short discussion as a whole class after a presentation about the presentation and strategies used during presenting. 6A-I4: The teacher indicated that he opened the discussion with “which news is correct, how do we know which to trust, how can we evaluate the quality of news?”

4.1.6.3. Related Factors Affecting Integration of the Online Learning Environment

Content of a lesson and content provided by the online learning environment affected the teacher's decision to use and integrate the online learning environment as presented in Table 4.9. The teacher had some decisions based on some characteristics of the content of a lesson, especially difficulty level of the subject topic. Similarly content provided by the online learning environment in terms of quality and match with the content of a lesson was another factor that affected the integration of the online learning environment.

Table 4.9: The Overlapping Factors Affecting Integration of the OLE

Strategy	Actions or Excerpts
Content of a lesson	T-25: I wanted to explain the subject topic. Because I knew that my students would have difficulty in understanding the logic of IF formula. I tried to explain the logic by giving examples and discussion of the IF algorithm so that students could understand the basic logic behind the IF formula.
Content provided by the OLE	6A-I3: He revealed that he investigated the related learning gains of the OLE and he didn't satisfied. He explained that the OLE consisted of providing book knowledge considering this learning gain.

4.1.6.4. Primary Purposes of Using the Online Learning Environment

The computer education teacher used the online learning environment for evaluation, providing demonstration, prior knowledge, and increase interest/motivation purposes as shown in Table 4.10. The teacher benefited from the online learning environment to prepare evaluation of his instruction. The teacher created paper-based, oral

quizzes, product evaluation forms and peer evaluation forms from the OLE. There were some times that the teacher directed his students to the OLE for the purpose of online assessment. Providing demonstration to the students was one of the most frequently used purposes. The teacher directed the students to the demonstrations provided by the OLE so that the students can watch the steps of doing an action for software. The students gained prior knowledge, especially before discussions, from the OLE. The teacher directed his students to the OLE so that the students can gain self-perspective or a kind of prior knowledge about a topic before involving a discussion. During the discussions students viewed each other perspectives and constructed an understanding about a topic with the guidance of the teacher. Finally, the teacher used the online learning environment for increasing the students' interest to lessons.

Table 4.10: The Overlapping Purposes of Using the OLE

Strategy	Actions or Excerpts
Evaluation	4A-I4, 4B-I4: The teacher stated that he developed the peer evaluation form by using the course book and the evaluation form exists in the OLE. 7A-I2: The teacher made a short verbal quiz before the end of the lesson. He explained that he asked the questions provided by the OLE.
Providing demonstration	4A-I2, 4B-I2: The teacher directed his students to the OLE which provides demonstrations of 'inserting a clipart picture and inserting a picture from file' (two minutes) and 'changing the slide design' (fifty seconds).
Prior knowledge	6B-I1: So he decided to direct his students to related learning gains page of the OLE in order to study the lesson topic and concepts. After the students studied the subject for approximately ten minutes the teacher started a discussion about the concepts.
Increase interest/motivation	6B-I2: The teacher explained that the movie was very good in terms of taking attention of students and matches very well with the learning gains of the unit.

4.1.7. Results of the Teacher's Perceptions about Online Learning Environments

4.1.7.1. The Teacher's Expectations about the Online Learning Environment

Before presenting his expectations from such an online learning environment, the teacher evaluated the Online Learning Environment according to his experiences with it. First, the teacher evaluated the existing features/functions of the OLE. The teacher stated clearly that the OLE has sufficient content explanation. He continued that the content provided by the OLE is simple and appropriate for students' levels. He explained that the provided content can be said it has a unity. The teacher also stated many times that use of the OLE, generally, saved time and enabled him to spare much time for dealing up with students individually.

The teacher gave some examples for the positive perspectives of the OLE. For example, he stated that "the movie presented in the OLE for subject explanation was funny and provided more participation to the discussion session of the lesson" considering learning gain 6.4.1. The teacher continued that "presence of visuals provided students to see and understand what are they going to do. It is not the aim of the OLE to teach a topic to students rather the mission of such a learning environment is to prepare students for the lesson. My students were also aware of this situation most of the time. They knew that they can initiate their learning and they were going to be supported by me or their friends". The teacher added that when students study from the OLE they, somehow, participated to the classroom discussions more when compared to his traditional discussion sessions.

On the other hand, the teacher has criticized some of content of some learning gains. For example, considering the learning gain 6.3.2 the teacher stated that "the examples provided in the content explanation were not enough. There could be more examples". Another example is that the teacher stated that "subject explanation could be simplified..." and "... there could be much oppositeness for explaining the subject

so that students could make sense of the topic easier” considering the learning gain 6.3.4. A different kind of example is that for the learning gain 6.4.4 the demonstration provided by the OLE was explaining the Photoshop, however, the teacher stated that he hasn’t have computers that Photoshop installed. Therefore instead of directing his students to watch the demonstration from the OLE, he demonstrated the MS-Publisher from projector. The teacher pointed out that some subjects were difficult when compared to some others. He explained that for such difficult subjects he felt that he had to explain the subject in class although the students were studied it before coming to the class.

The teacher stated his expectations from such an online learning environment. He underlined that he was not satisfied with the evaluation pages of the OLE. He expressed that evaluation pages would be much attractive and interactive. He stated that in general evaluation pages were can be classified as classic. He detailed that more interactive and different kinds of evaluation activities should be presented. He provided examples such as matching activities, some interactive flash animations or some kinds of group projects should be presented.

The teacher pointed out that although content explanation pages were good enough, there should be more examples considering some learning gains. He detailed that some topics require more examples, sometimes contradictory examples for students’ understanding of the topic. The teacher indicated that his students were generally interested in more interactive activities, too.

The teacher summarized that more interactive evaluation pages could increase the students’ interest and perception about the evaluation. He stated that content pages were good enough and he was satisfied with the content. He wanted to state that the demonstrations provided him to save time and deal up with students much efficiently. He indicated that demonstrations were also perceived well by his students and he claimed that his students were benefitted much from the demonstrations.

4.1.7.2. The Teacher's Perceptions about the use of Online Learning Environments by Other Subject Area Teachers

The teacher explained his opinions about use of similar online learning environments by other subject area teachers. He explained that other subject area teachers can integrate similar online learning environments into their curricula effectively too. He mentioned that content explanation could be a beneficial for teachers to direct their students for studying at home. He compared his lesson with other subject areas that “computer course is more interactive course when compared to some other courses. However, the important thing is to there should be visual materials which can attract students’ interest. Otherwise, it won’t be different from a book”. The teacher stressed that evaluation pages should be interactive so that students can feel a difference from a paper based quiz. The teacher stated that

“I don’t expect that other subject area teachers will have problems using similar environments. To mention and compare with my lessons, I didn’t have many problems while implementing the OLE. I believe that similarly other subject area teachers do not have many problems. There might be some technical problems while using computers (or instructor computer) but in such cases they can request help of computer teachers or other technical staff. Furthermore, I don’t think that they will have any problems considering classroom management. [T-34]”

The teacher stated another point that he had also faced. He mentioned that some difficult subject topics might need some alternative approaches. The teacher made it clear that “from my sentences it could be understood that I’m replacing a teacher with an online learning environment. My comments are not related with replacing rather supporting the lesson with technology. However, supporting means does not providing low quality materials”.

Finally the teacher presented his ideas about the required steps for integration of online learning environments by other subject area teachers. The teacher stated that

“First, there must be well-developed content and rich materials including appropriate visuals. Second, teachers should be familiar with computers and using computers. Third, their load of course hours might be decreased so that they can spare much time for planning their lessons toward a technology supported form, and load of their courses might be reduced. [T-35]”

The teacher detailed his opinions that without having a well developed content and materials it would be difficult for a teacher to direct or reference any online learning environment. He claimed that one of the first requisites of integrating an online learning environment is to have an online learning environment with high quality content and materials embedded into it.

The teacher stressed the importance of teachers’ experience with computers, internet and online learning environments. He claimed that many teachers, especially older ones, are not good computer users. Some others do not have any theoretical knowledge and practical experience of using computers in classrooms. Therefore, integrating computers into a curriculum or using an online learning environment requires that a teacher to know how to do it. He explained that

“I know many of the new graduated teachers took computer courses, and learn how to use computers, but when you ask some of them -how do you use computers in your classrooms- you cannot get a satisfying answer. On the other hand, there are such teachers that they effectively use computers and the Internet in their lessons. I have seen some teachers, even if just a bit, asking me about when s/he can use computer laboratories for his lesson. [T-36]”

However, when the number of such teachers increases the existing computer laboratories will not be enough to meet the demand. Therefore, new infrastructure and new investments will be required. He concluded that whether universities, or Ministry of National Education or private sector should prepare high quality materials for teachers to use. He revealed that he gives too much importance to materials because he sees it a necessity and prerequisite. He stressed that

“It is not realistic to expect teachers to create their materials. First, not all of the teachers know how to create or develop instructional material. Second, they don’t have time for developing course materials. Therefore, like traditional books, electronic materials should be developed for teachers to use them. MoNE might provide similar to an activities CD for other subject area teachers or create a portal for supporting teachers to increase their instruction by use of technologies. [T-37]”

CHAPTER 5

DISCUSSION, CONCLUSION AND IMPLICATIONS

The purpose of this study was to investigate how a computer education teacher utilizes the online learning environment. The study tried to explain how computer education teacher used information technologies in learning process, which strategies s/he used during the integration process of the online learning environment into the learning process, how s/he solved the problems s/he faced and expectations from an online learning environment. In this chapter, the data presented in the previous chapter are discussed and interpreted addressing the research questions.

5.1. Discussion

The history of Instructional Technology (IT) can be traced back to times of 500-380 BC (Saettler, 1990). Elder sophists were teaching about theory and philosophy and the students were listening to them and practicing, which can be stated as the foundation of expository teaching and discussions. Humans social life, demands, requests, materials, technology has been changed too much from that time. In our century, the roles and responsibilities of students and teachers changed as much as the role of technology.

Throughout history of IT, there were periods when the developments in the technology guided IT, and there were times when learning theories guided IT. We have been thinking about how we can benefit from the capabilities of the technology like computers, internet, cellular phones and other popular technologies. There have

been always discussions and criticism about use of technology in education or directly pointing the failure of technology in education; for example, why TV was not used effectively in learning environments (Rosenberg, 2001), “Why computers are failing in the education of our children” (Chadwick, 2002) and “Why most CBT doesn’t work and how it can be better” (Rosenberg, 2001). Moreover, the popular Clark-Kozma debate (Clark, 1983; Kozma, 1994; Clark, 1994) became one of the important readings of the field instructional technology. Amiel and Reeves (2008, p. 29) summarizes this situation by stating that

The role of educational technologies in improving educational practices and outcomes has been criticized as over-hyped and insignificant. With few exceptions, the state of education has changed less than expected as a result of tools such as computers and the Internet.

The above examples show that technology has been changing, and the expectations from a newer technology increases. Moreover, not only the technology developed and changed by time, the definitions (e.g., roles, emphasis given to theories, methods, etc.) have been changed, too. Mostly based on Reeves’ (1999) research agenda, Amiel and Reeves (2008) continue that

We argue that traditional *predictive* research in educational technologies has had *limited impact in informing actual use*. In other words, educational technology research aimed at examining the influence of tools in the educational process has offered little systematic advice to the practitioner. We argue that recognizing technology as a process has implications for how educational technologists conduct research. Once recognized as a process, the aims/ends of technology come to the foreground [italics added] (p. 30).

The 1994 definition of the field lists the domains of instructional technology were defined by Seels and Richey (1994) and the 2004 definition of the field also addressed domains without explicitly naming them. The domain of utilization (Seels & Richey, 1994) which is named as ‘using’ by Molenda and Robinson (2004a) implies use of the technological resources and processes for facilitating learning. The

subcategories or stages of utilization are explained with different terms by the above authors. Three stages of utilization are described by Molenda as usage, installation, and institutionalization where a change in the culture of an organization is achieved. There are also researchers using different nomenclatures for classifying their results. For example, Wilson and Wright (2007) categorizes teachers' technology use under five stages which are familiarization (learning how to), utilization (trying technology), integration (using for certain tasks), reorientation (focus on student learning, not only for delivery of content), and evolution (adoption of technology).

In general this study tried to shed light on the utilization domain via focusing on real use of technology for instruction. In other words, the study aims to understand the integration process of using the online learning environment. More specifically, the study tried to explain how a computer education teacher uses information technologies in learning process, which methods s/he used during the integration process of the online learning environment into the learning process, how s/he solved the problems s/he faced and her/his expectations from an online learning environment.

5.2. How Does the Computer Education Teacher Use and Utilize the Online Learning Environment?

To explain the teachers' usage and utilization of the online learning environment the elements related to the teacher's instruction are explained. Figure 5.1 shows that the teacher uses examples, discussions, demonstrations, content explanations, activities, projects, and evaluation to form his classroom instruction. In the figure, the elements (discussions, activities, and demonstrations) that were used more frequently emphasized in bold font face. These elements supported the teacher's classroom instruction and served for various purposes. The teacher used the online learning environment for enhancing the elements of his instruction. For example, teacher used the examples provided by the online learning environment to present alternative examples, or content explanations for providing prior knowledge for discussions.

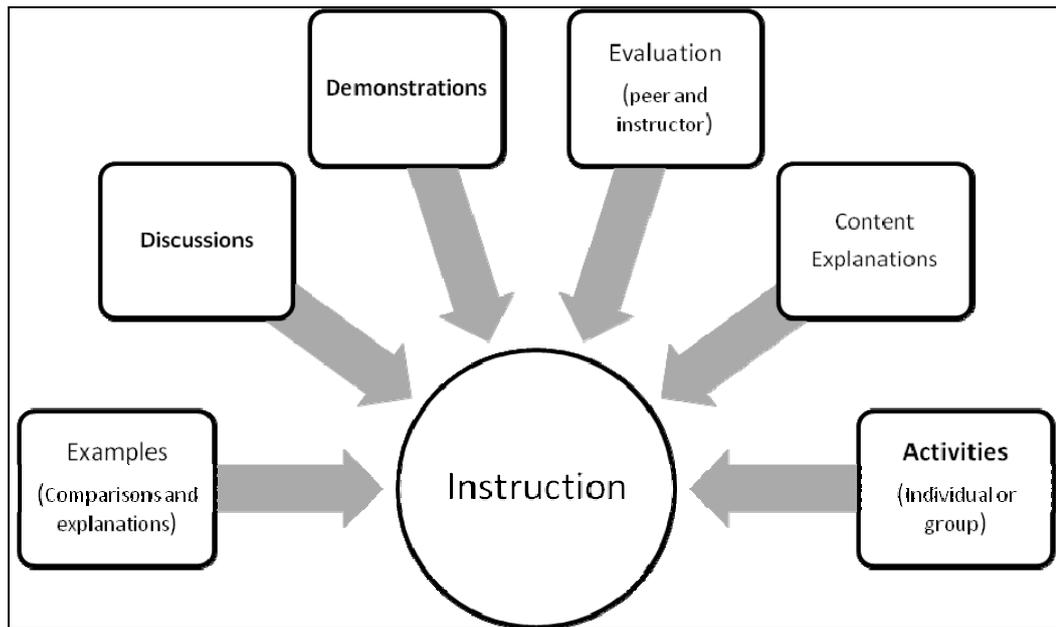


Figure 5.1: Elements of the Teacher’s Instruction

Briefly, demonstrations and content explanations provided by the OLE were mainly referred by the computer teacher. The teacher most of the time preferred demonstrations of the OLE instead of his own demonstrations. The teacher referred to the evaluation pages of the OLE less when compared to other pages.

The teacher utilized the OLE for (i) preparing and supporting content explanations, (ii) preparing and providing alternative examples, (iii) supporting activities, (iv) supporting discussions, (v) presenting demonstrations, (vi) supporting projects and (vii) preparing evaluation. The purposes of teacher’s use of the online learning environment were to support his classroom instruction. Hayes (2007) also found that teachers utilizing information and communication technologies for supporting and supplementing existing classroom practices.

The teacher benefited from the OLE for preparing and supporting content of his lessons. The teacher used the information share section of the OLE for presenting

information to students, and preparing content of his lessons. The students sometimes did individual studies from the information share section.

The teacher used the OLE like a teacher's resource book and most of the time for providing alternative examples. The implementation of the lessons indicated that the teacher mainly used examples to explain the concepts, to compare differences, and to provide exemplary materials. The pedagogical reasoning of the teacher's emphasize on using of examples can be explained by his own words as

providing much information does not guarantee having students who learned much. *However, providing enough examples helps a teacher to enrich sources that can be presented in classroom.* Therefore, most of the time, I preferred referring to the examples, animations or movies of the OLE.

The teacher used demonstrations of the OLE to support his demonstrations. The teacher mainly directed his students to the demonstrations of the OLE. Moreover, presence of demonstrations helped the teacher to organize and enhance activities. The information share section of the OLE provided an information source for the students to gain prior information about a topic thereby helped to discussions.

The teacher benefited from the OLE for preparing the evaluation of his lessons. The teacher created some evaluation forms and questions for preparing quizzes by benefitting from the OLE. For example, the teacher created peer evaluation form based on the criteria provided by the OLE or teacher's evaluation form for assessing students' performance was created both using the course book and the related evaluation page of the OLE. There were some specific situations that, in the last lesson session of grade 4A and 4B the teacher didn't use OLE for other purposes but for evaluation purposes. The evaluation questions provided by the OLE were not only used for examination purposes, they were also used for introduction to the lesson and warm up purposes or for summarizing the lesson at the end. For the section 6A, questions provided by the OLE were used for summary of lesson. The

teacher conducted a question-and-answer session by using the questions provided by the OLE.

The teacher also assigned homework and reading assignments to his students, especially for sections 7B and 7C. The teacher required his students to study the subject topic at their home for these sections. The results imply that the first lesson hour most of the students didn't do their assignment before coming to the class. However, for the following lessons more students did their reading and practice assignments before coming to the laboratory. The results showed that the teacher's insistence resulted in positively that students became coming to the laboratory having studied their assignments.

Enablers of Using the Online Learning Environment

It was revealed from the results that use of the OLE enabled the teacher to (i) spare more time for dealing with students individually, (ii) provide another information source for students, (iii) increase students' motivation and interest to the lesson. In the following paragraphs these three enablers are discussed.

(i) Spare much time for dealing with students individually

The teacher stressed that the OLE demonstration enabled him to spare more time for students who needed help. The results of the study conducted by OTA (2005) indicated that 70% of accomplished computer-using teachers stated that "I spend more time with individual students" (p.153). A current study from Turkey revealed that 77.9% of the social studies teachers agreed that use of technology enables effective use of class time (Gulbahar & Guven, 2008). The findings of this study showed that the presence of demonstrations provided students another information source than the teacher. Therefore, the number of students requiring teacher's help was decreased. There were two kinds of students, the first group of students referred to the OLE demonstration when they needed help or forgot a step of an action. The second group of students still requested the teacher's help and guidance. From the

interviews, it can be interpreted that there were always some students requesting help from the teacher and sometimes their friends. The presence of the OLE provided another help source that students can apply for routine steps/operations.

(ii) Provide another information source for students

The results indicate that it was not only the demonstrations but also the content explanations served as information source. Many times the teacher assigned study topics for his students to have basic information about subject topic. Therefore, the students can take active role in their learning from passive listeners to active learners. The teacher tried to place students at the center of their learning. Instead of explaining the subject topic, providing definitions of terms, or stating the differences between some concepts, the computer teacher preferred the students to comprehend the information at hand, discuss the differences between concepts and build their understanding. It is important to note that the students were not alone to process this learning phase. The teachers' presence and guiding through a lesson also support students in their learning.

The findings showed that the presence of the OLE was perceived by the teacher and so the students as other information source. The teacher stated that with use of the OLE, his students became aware of reaching information by them from another source. The teacher stressed that

“Another point that took my attention was that, there was more participation to class discussions. I guess that, students knew that they didn't have anything to miss”.

With the presence of another information source students can be actively involved in lessons. Providing other sources of information does not mean leaving students alone with themselves and expecting them to build their learning. Providing different information sources enables students to gain different perspectives, investigate various examples and compare information. However, providing another information source doesn't have to result in a better way of learning. It requires some other

supportive actions to be taken. The most important method the computer teacher used was discussions. The computer teacher created discussion environments most of the time in order to provide his students to share their knowledge and view perspectives of other students. Thereby, the students can build their own knowledge rather than rough memorization of definitions and concepts.

The teacher also used content explanation pages of the OLE. The teacher assigned homework for students for some lessons. The teacher requested his students to come to the class by studying the subject topic from the OLE and sometimes students studied the subject topic during lesson hours. Moreover, it was clear that students were also aware of that the teacher was also present to observe their actions and provide help in case they need.

(iii) Increase students' motivation and interest to the lesson

The results showed that the movies presented in the content explanation pages of the OLE increased the students' motivation and interest in some lessons. It can be understood from the teacher's responses that videos, other than demonstrations, caught interest of students. The results also presented that when the lesson starts with such activities students participate more than usual. The teacher stated that

...the advertisement movie in the OLE was attracted all of the students' attention than he was expected.... the movie was very good in terms of taking attention of students and matches very well with the learning gains of the unit

The interviews revealed that especially when the subject topic was suitable for discussion, presence of such introductory activities increased students' participation to discussions. The results also showed that not only the participation to the discussions but also the climate of the class was positive. From the results it can be interpreted that when students motivation and enjoy were increased, students interest to the lesson topic was increased, too.

5.2.1. Which Methods/Strategies Does the Computer Education Teacher Use During the Integration Process of the Online Learning Environment Into the Learning Process?

Instructional strategies are “the activities used to engage learners in the learning process” (Akdemir & Koszalka, 2008, p. 1452). The findings of this study showed that the computer teacher used two main strategies according to content of lessons. The main strategies, both the teacher used and as student activities, can be classified as (i) assigning a task and (ii) discussions.

Inan, Lowther, Ross and Strahl (2010) identified the instructional strategies used in classrooms. They listed strategies as direct instruction, coach or facilitator, use of higher-level questioning, cooperative or collaborative learning, and project based learning. They also listed independent seatwork, experiential/hands on learning, systematic individual instruction, sustained writing/composition, sustained reading, independent inquiry/research, and student discussion as student activities (p. 543). By investigating English teachers’ classroom instruction Top (2007) listed strategies as “creating student-centered environment, following course books, using intervals for elaborations, creating practice environment for students, using indirect methods, making preparation then letting students perform, considering multiple intelligence theory, controlling students’ understandings through applications, and using the available sources” (p. 154). Although various authors defined different terms and listed various strategies, Parker and Hess (2001) clearly stated that discussion is an instructional strategy.

(i) Assigning a task

The implementation of lessons indicated that the computer teacher assigned tasks for the students in many of his lessons. Teacher’s assignment of task includes students’ individual study aiming to complete the given task. The term ‘task’ is used instead of ‘activity’ as Ellis, Goodyear, Calvo and Prosser (2008) distinguished the two terms. They defined task as the work prescribed by the teacher and activity as what students

really do. Therefore, from teacher's perspective a task is assigned, and from students' perspective students engaged in an activity. Furthermore, the curriculum of the computer course also used the term activity (MoNE, 2005a; İBDÖP, 2006) and the curriculum was mainly adopts activities as an instructional strategy. The computer course requires students to perform operations of software, therefore, students completed some tasks during each lesson to learn such operations. Most of the time students individually performed the tasks. From an individual study perspective, completing a task was supported mainly by the demonstrations of the online learning environment. Figure 5.2 shows the relationship of individual study (performing an activity) and the OLE, the teacher, and other students.

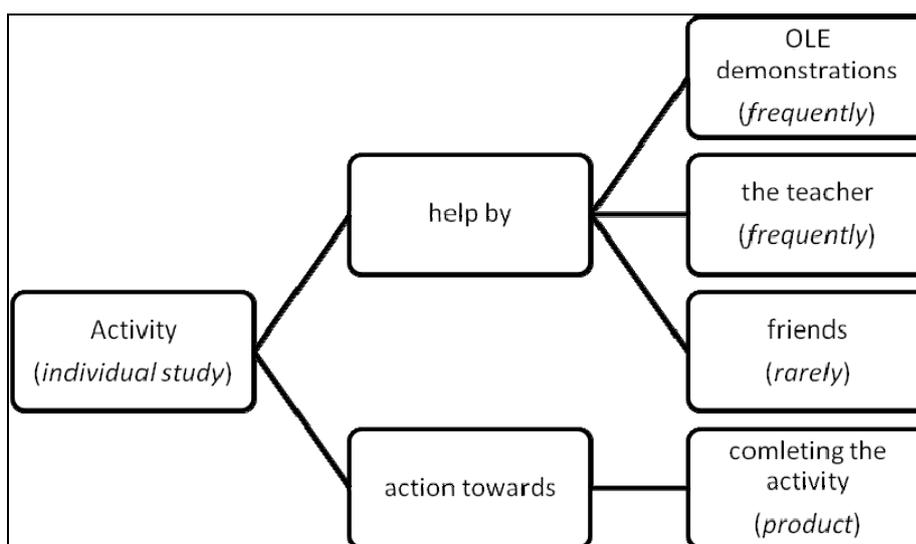


Figure 5.2: Activity and Related Actions

The results show that the teacher preferred demonstrations because they provide a kind of follow and do style in which comprehension is not obligatory. When the subject topic requires students to comprehend a subject topic or require understanding of a logic the teacher preferred his explanation of content or gaining

fore-information from the OLE with mostly followed by discussions. The teacher's classification of lesson topic was the main factor for the teacher's preference. The teacher followed introduction to lesson, demonstration of the OLE and students' individual study (help and guidance during this session), students' practice aiming remediation and evaluation for subject topics related to learning about software and using software.

(ii) Discussions

Larson (1999) defined two types of discussions as method of instruction and discussion competence. Method of discussion focuses student engagement in lesson and learning academic content, whereas discussion competence focuses learning about discussing. Parker and Hess (2001) described the two different types of discussion as teaching with discussion (as method of instruction) and teaching for discussion (as a curriculum objective). In this study teachers' use of discussion is identified as a method of instruction (teaching with discussion) except for one lesson which aimed to teach students to 'interpret visuals from a critical point of view'. Diezt-Uhler and Bishop-Clark (2001) distinguish face-to-face discussions and the Internet-based discussions. To note that, in this study the term discussion refers to face-to-face discussions.

For subject topics requiring students' to process information to knowledge and gain perspective for a subject topic, or learn academic content (Larson, 1999), the teacher preferred discussions most of the time. Therefore, in order to create an efficient discussion environment, the teacher directed his students to content explanation (information share) section of the OLE or sometimes he explained introductory information so that his students have prerequisite or prior-information about content. After this individual study session with the OLE or teachers' introductory session, the teacher opens a discussion for the students to share their ideas and gain perspectives about subject topic and learn content. In other words, the teacher wanted to create an environment for his students to "construct an understanding about the topic" (Larson, 1999, p. 662) via their interactions with their friends by his guidance.

Therefore, via discussions students can interpret, analyze, and manipulate information (Larson, 1999) or broadly gain an understanding (Ellis, Goodyear, Calvo & Prosser, 2008) as active participants. Furthermore, Larson (1999) found that “students have to have knowledge of a topic before they can talk about it” (p. 667). Similarly in this study the teacher used the online learning environment to provide the students to obtain some prior information/knowledge about a topic.

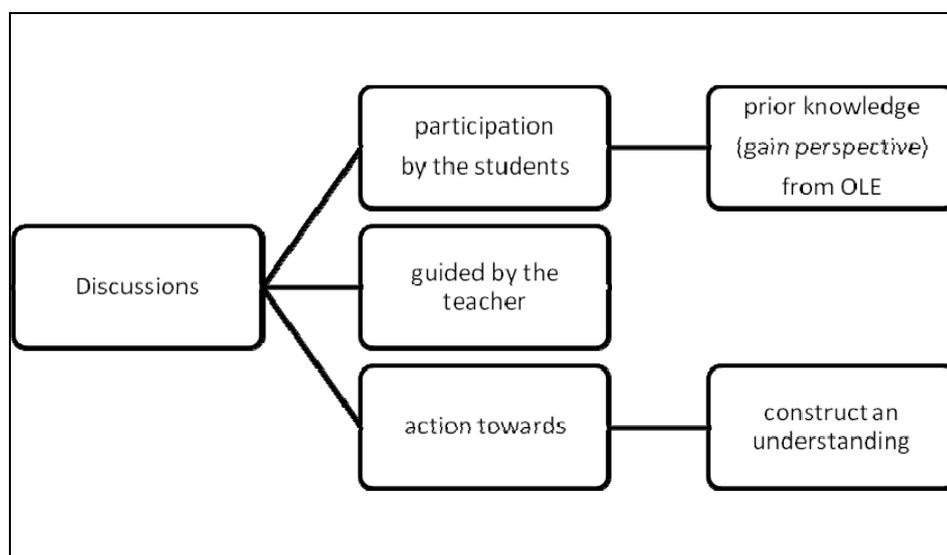


Figure 5.3: Discussions and Related Actions

5.2.2. What Are the Related Factors Affecting Integration Of Online Learning Environment Into Curriculum?

The results provided that integration of online learning environment is affected by content of the lesson, content provided by online learning environment and learning materials.

Content of the lesson

The results showed the content of the lesson to be one of the factors affecting integration of online learning environment. The computer teacher had some decisions based on some characteristics of content of some lessons. The findings showed that the teacher's preference dependent on the difficulty level of subject topic. For example, for one lesson the computer teacher explained that the content of the lesson was classified as difficult. It was understood that the teacher prefers the OLE demonstration when the subject topic is relatively easy (in his terms). In other words, it can be seen that if the subject topic requires much mental processing of students the teacher preferred his explanation and demonstration of subject topic. What is meant by difficulty of subject topic was also explained by the teacher for clarification. The teacher compared two lesson topics; IF formula and inserting charts. The teacher explained that inserting chart is not as complex as using IF formula. The teacher stated that

..., I wanted to explain the subject topic rather than directing my students to the OLE. When the subject topic is related to doing an action for software, students can easily follow the demonstrations and explanations of the OLE. On the other hand, when the task requires students to progress a mental process like IF formula, students need to ask questions and according to my answers and directions students try to understand the logic.

Oncu, Delialioglu and Brown (2008) described 'applicability' as "whether the topic of the lesson and supporting technology match. Essentially, how applicable is the technology to the lesson being taught" (pp. 30-31). An excerpt from their results show a very similar way of thinking with the above statements of the teacher.

Is technology really applicable to this topic, or does the topic really need to be taught without the use of technology initially and then may be enhanced with technology later on?

Both quotations present a common understanding that some topics might need to be explained by the teacher or without using technology. Oncu, Delialioglu and Brown

stated that although interview data indicated decisions about instructional objectives precede decision about technology use, they found via document analysis that some teachers actually making decisions according to content of the lessons and technology use for determining the flow of the lesson.

Content provided by online learning environment and learning materials

The presence of, quality and match with the content of the lesson were indentified to be the criteria that affects teacher's decision to whether to use online learning environment or not.

For some lessons the teacher indicated that the OLE should have more examples related to the corresponding learning gains. He stated that the OLE could provide both good and bad design examples. The teacher concluded that course resources such as books, teacher CDs, or supplementary web pages should have various, and sometimes alternative materials for a teacher so that a teacher can focus much on implementation of a lesson. On the other hand, for another learning gain the content provided by the OLE was good to provide enough information for the students. Especially, the movie that criticizes two different posters (one is well-designed and the other is bad) affected teachers decision to use them during his lesson.

For one lesson the teacher's teaching strategy didn't match with the strategy provided by the online learning environment. For some, providing what can be called book information/knowledge could be enough, on the other hand, for some topics presenting an activity for a topic could best match with the teachers' strategy. Therefore, not only presence of content or learning materials, but their match with teacher's teaching/learning strategy also affects teacher's adoption of online learning environment for his lessons. For example, for some learning gains, the content and learning materials provided by the OLE attracted the teacher's interest and matched with teacher's teaching strategy. The advertisement movie was one of them that suitably matched with the aims of the specific learning gains.

One critical issue observed during the study was the mismatch between the teacher's intention and OLE demonstration. Although, the OLE provided a demonstration for a learning gain the teacher intended to present, the demonstration was prepared with a different software which was not installed in computers the students used. Therefore, the teacher didn't direct his students to use the OLE. Another example was that for the learning gain which was explaining inserting charts, the demonstration of the OLE was showing the selection step in a different way, which caused the teacher to explain and demonstrate the selection step once more based on his style of selection.

The results also showed that most of the time the teacher used the online learning environment. In general, the teacher believed that the examples, animations/demonstrations and movies provided by the OLE enriched the teacher's teaching/learning materials so that the teacher referred to the OLE many times. For many times, the animations and the demonstrations, the examples and content explanations provided by the OLE were described as well-prepared and well-designed by the computer teacher.

5.2.3. According to the Computer Education Teacher, What Are the Primary Purposes Of Using the Online Learning Environment?

The purposes of using technology and online learning environments were defined in various perspectives by different authors. Hughes (2004) provides a different perspective like grading systems which enables students' and parents' access information. On the other hand Ertmer, Addison, Lane, Ross and Woods (1999) explained use of technology for presentation, providing additional resources, and engaging visuals to support current lessons. Similarly, Mathews (1996, p. 2, cited in Bebell, 2003) considering different purposes of teachers technology use developed models to represent them. The purposes are: preparation of class materials, reporting attendance, use of the Internet, word processing, tutorials that explain concepts/methods, and drill and practice.

Top's study (2007) revealed that English teachers used technologies to “*provide visual help, get students attention, create a learner centered environment, enable students to speak, give more than one stimulant, enable them to practice, improve students listening, encourage students, develop students pronunciation, show daily use of English, and have audio familiarity with some language items*” (p. 153, italics added). Top's (2007) list of purposes can be narrowed for a more general purposes classification. Providing visual help, enabling students to speak, and some others can be listed under supporting students' learning category. Other categories can be to get students attention or interest, to create a learner centered environment, to practice and to evaluate which was not explicitly listed in Top's list. This study provides an additional item, prerequisite/prior knowledge, which also has some common points and similarities with creating a learner centered environment. Sivin-Kachala and Bialo (2000) state that “introducing technology into the learning environment has been shown to make learning more individualized and student-centered, to encourage cooperative learning and to stimulate increased teacher-student interaction” (p.13).

The results showed that the computer education teacher used the online learning environment for different purposes. The teacher used the online learning environment for evaluation, providing demonstration, providing other information source for having students with prerequisite/prior knowledge about a subject topic and increasing the students' motivation and interest to the lesson. Prior knowledge also helped creating a learner centered environments most of the time.

Evaluation

Bebell (2003) found that most frequently teachers use technology for creating tests, quizzes, or assignments. The computer teacher used the questions provided by the OLE and some evaluation forms to prepare evaluation of his lessons. The teacher especially used evaluation forms to prepare criteria for evaluating his students' products and progress.

The computer education teacher didn't use the evaluation part of the OLE as much as demonstrations and content explanation parts. The reasons behind this is discussed and rationalized under expectations from an online learning environment section. The computer teacher used the evaluation of the OLE for preparing evaluation forms for his students. Furthermore, the teacher directed his students to evaluation pages of the OLE for online assessment. The evaluation pages of the OLE were consisted of mostly multiple choice quizzes. Therefore, it can be stated that the teacher expected more interactive and interesting evaluation activities rather than pure open-ended questions. On the other hand, the teacher used the online learning environment for preparing peer evaluation forms, creating evaluation criteria for assessing students' performance and products, preparing paper-based quizzes, and directing the students for online self-assessment.

Providing Demonstration

According to the results of this study, the main purpose of the computer teacher in using the online learning environment was for showing demonstrations of software to students because of the nature of the computer course. The computer course requires students to learn how to do some operations for software. Computer teachers widely use demonstration for showing steps of doing operations of software. Similar to evaluation demonstration was another important feature of that an online learning environment should provide. First of all, the implementation of the OLE revealed that the computer teacher benefited from demonstration most. Moreover, presence of demonstrations enabled teacher some advantages which were discussed before. As discussed later, the demonstrations increased the students' self-confidence which enabled the students to do better individually. Therefore, students perceived themselves as successful in doing operations of software. Sivin-Kachala and Bialo (2000) concludes that when students self-confidence and thereby success are increased they enjoy much and perform better.

Prerequisite/prior knowledge

Many of the lessons were initiated with classroom discussions. For example, at the beginning of a lesson the teacher introduced the students two kinds of documents aiming a discussion about the differences of these two documents. As a result, students can reveal that word processing software is not enough for presenting information. The computer teacher believes that discussions are much beneficial for students to understand and comprehend a subject topic. The OLE served as information source that students can have basic information about the lesson content so that they can participate to the discussions with the necessary prerequisite/prior knowledge. In other words, with discussion session the teacher wanted his students to share their ideas about a subject topic, but their ideas should be rationalized and related to the lesson topic. Becker (2001) terms the above situation as “information-gathering objective” (p. 8).

The OLE enabled the students to retrieve some prerequisite knowledge and ideas about a subject topic and discuss further. Moreover, for sections 7B and 7C the teacher requested his students to study from the OLE before coming to the class. It was seen that for the first lesson hour there were more students who didn't study and practice their assignment before coming to the class. However, for the following lesson hours the number of students, who did study, was increased. The teacher wanted his students to have some basic information and practice about the lesson so that they can learn much better in the lesson hour. As seen, the computer teacher used the OLE for preparing his students for lesson in terms of having students with some prerequisite knowledge about the lesson topic. The students, studying from the OLE participated in discussions and got involved in activities more than the ones who did not study from the OLE.

Increase interest/motivation

The examples and movies provided in the content explanation pages of the OLE were used by the computer teacher to take attention of students and increase their

motivation towards the lesson. The movies, not the demonstrations, available in the OLE were characterized by the teacher as interesting, attractive or motivating for the students. The results also indicated that whenever such introductory learning materials were used, students participation to discussions and classroom activities were increased. The findings of this study are parallel to the existing literature about “the power of technology to motivate students and to improve their attitudes about themselves and about learning” (p.101, Siviv-Kachala & Bialo, 2000). OTA (2005) research stated that “technology can be a key vehicle for stimulating learning, primarily because *it creates environments and presents content in ways that are more engaging and involve students more directly* than do textbooks and more traditional teaching tools [italics added]” (p. 165). Baek, Jung and Kim (2008) also found deriving students attention as the second key factor for teachers to use technology in classrooms.

5.2.4. The Categorization of Teacher’s Usage

In general the teacher can be said to be in ‘installation’ stage (stages of Molenda, 1993) based to his use of the technology in education. Just to note, the teacher can be said to be between integration and evolution stages according to Wilson and Wright’s (2007) classification. For the purpose of using a common nomenclature, the stages of Molenda are used.

In this study, rather than identifying the stage that the teacher is in, the theoretical base of teacher’s use of technology is explained and discussed. Molenda (2005) explains the theoretical base for use of media in teaching. From the *cognitive approach perspective*, learners’ mental and emotional processes during instruction are focused. Application of cognitive approach involves presenting information to learners, or allowing learners to read material and show mental efforts to comprehend it. The presentation of information aims to match with learners existing mental structures. Teachers’ role is identified to work to gain students’ attention and interest. Furthermore, teacher provides analogies, examples, and outlines so that new

information is more easily attached to learners' schemata and therefore easy to remember. Practice is one of the factors that improves retention and use of newly gained skills. Strategies used by the practitioners of cognitive approach gains attention of learners, matches with learners existing knowledge, organizing content, presenting new information and practice and feedback (Foshay, Silber, & Stelnicki, 2003). Therefore, lecturing, or presentations supported by audiovisual materials are used, self-study is apprenticed, group discussions problem solving activities, and exercises are mainly preferred.

Constructivist approach points a different style of focus for the learning process. Ernst von Glasersfeld provides a theory of knowing, epistemology as the base of constructivism:

experiential world is constituted and structured by the knower's own ways and means of perceiving and conceiving, and in this elementary sense it is always and irrevocably subjective (1992, cited in Molenda, 2005).

Application of the theory addresses situative context, use of authentic materials so that learners take responsibility of their learning, importance of social context, interactions with the environment, discovery learning, learning from mistakes, and problem or project based or ill structured environments. Constructivist approach focuses on learner-centered approaches, and change of teachers' role in the educational context, suggest learning with media instead of learning from media. Examples include learners producing document, multimedia productions especially with collaborative work, participation to social scenarios, tutorial programs allowing variable consequences and multiple branches inclusion of virtual reality, dynamic interactions. Molenda (2005) stated that "digital technology also makes it possible for reading-type activities to become less passive, more active, and more learner-controlled. Examples:

Web text with links allowing the reader to connect related ideas (hypertext), possibly incorporating sounds and motion images (hypermedia).

Web-based practice exercises that allow learners to choose different answers in order to experience the consequences of their decisions.

Based on the above definitions and descriptions and the results related to the teacher's use of the technology, the teacher benefited from applications of both approaches, but mainly the cognitive strategies. The teacher's use of the online learning environment implies that the teacher used strategies of gaining the attention of learners, the importance of prior knowledge of the learners for presenting new knowledge and skills, and valuing practice activities. On the other hand the teacher showed efforts to student-centered environments, by valuing their ideas, trying to integrate learners in evaluation processes, trying to use different forms of technology to address different perspectives, by providing other information source (both for prior knowledge, which addresses cognitive implications, and for indicating that teacher is not the only information source, that students learn from), preferring group activities, and trying to provide an activity based environment (but it can be said that not a well-designed project based environment).

To sum up, the strategies the teacher applied includes strategies from both cognitive approaches and constructivist approaches. As Molenda (2005) identified different theories provide and suggest guidance for different learning goals. Lever-Duffy, McDonald, and Mizell (2003) advise:

you may choose to use some parts of each theory or accept a learning theory in its entirety. At this point, you should examine all the options and let your own mental model of learning develop (pp. 16-17).

Therefore, a teacher's aim addressing different learning goals might require implications from different theories. Roblyer (2003) suggests that "when the absence of prerequisite skills presents a barrier to higher level learning or to passing tests, directed instruction usually is the most efficient way of providing them" (p. 73).

5.3. How Does the Integration Of the Online Learning Environment Affect the Learning Processes According to the Computer Education Teacher?

The results showed that integration of online learning environment affected learning process by saving time and enabling teacher individually deal with students, increasing participation to activities and discussions, and increasing self-confidence of students. It was discussed above that using the demonstrations of the OLE increased the teacher's time for individually dealing with students. Sivin-Kachala and Bialo (2000) reported that students' self-confidence increases when instruction is supported by technology.

The students referred the demonstrations when they want to watch how to do an operation of software. Therefore, the presence of demonstrations decreased the number of students who need help of the teacher to show how to do some operations/steps of software. This decrease enabled the teacher to provide more help to students who preferred teachers help rather than an OLE demonstration. In other words, with the presence of demonstrations the teacher spared time for some other students. Schofield (1997) also identifies a similar shift from whole classroom instruction to interacting more with individual students with the use of computers in classrooms.

It is worth to note that the teacher's answer was not specific to use of demonstrations for the above purpose, but the answer was much general. The responses of the study of Top (2007) also indicate saving teachers' time as an important benefit (as fourth ranked benefit) of using technology.

The results revealed that frequent use of the OLE, especially during introductory sessions, caught attention of students. Therefore, students were more motivated towards the lesson and their involvement in activities increased. The teacher clearly stated that "... another point that took my attention was that, there was more participation to class discussions". Ertmer, Ross and Gopalakrishnan (2000) also

found that use of technology created a more dynamic learning environment and students engaged in the learning process more.

Graham and MacArthur (1988, cited in Sivin-Kachala & Bialo, 2000) reported that students experiences with technology increases students self-confidence and those students perform better in similar learning situations. The results of this study are also parallel with the above that teacher underlined the perceived change in self-confidence by stating "... moreover, I believe that their [students] self-confidence was raised because they [students] knew that without asking to the teacher they were able to learn and complete a task or operation". A previously quoted sentence of the teacher explains the reason behind this self confidence. "...Therefore, a student knows that when s/he forgets some steps, there is an information source that s/he can get help". Similarly, Ertmer, Hruskocy, Johnson and Lai (1998) found that with the use of technology students' confidence and self-esteem were increased.

5.3.1. How Does the Computer Education Teacher Perceive the Students' Progress?

Using technology in lessons has effects on students and students' learning, even presence of technology affects students' perceptions towards lessons or a course. Coley's report in 1997 (cited in Sivin-Kachala & Bialo, 2000) indicate that use of technology positively affects students' independence and *feelings of responsibility for their own learning*. In parallel with the Coley's conclusions and OTA (2005) findings, the results of this study addressed that the students became aware of importance of their responsibility for their learning. The teacher's identifications revealed that with use of the OLE, the students became aware that they can reach information from other sources on their own. Moreover, it is important to note that similar to previous lessons the students were also aware that the teacher was also present to observe their actions and provide help in case they needed. This learning environment supports an active learning environment in terms of the teacher's perception of the students. The students were more active in the learning process.

They were not seen as passive information receivers rather they were seen as builders of their knowledge. The implementations of sections 7B and 7C showed that the students started to take their responsibility in their learning week by week.

The change in students' habits of studying is also worth to mention. For example the teacher requested students from section 7B and 7C to study the upcoming week's lesson from the OLE. At the first lesson there were more students who didn't study, at the second lesson this ratio decreased and the last week nearly all of the students studied their subject and practiced from the OLE before coming to the laboratory. The teacher explained this change as "... I guess next week most of them will come to class having studied their assignment because they were aware of that without studying at home they obviously have problems in doing the in-class activity, too". The students became aware that they have a role in their learning so they started to show some effort.

The results indicate that the students were much active when they were introduced the lesson topic with interesting visuals. For example, the presence of interesting lesson content, especially movies, increased students' participation rate to discussions and activities. The materials must not need to be funny for attracting students' interest. Materials that provide different perspectives, visual elements, and some contradictory and extreme examples also help to catch students' attention. Therefore, such introductory materials are helpful for teachers to have students who are less or more motivated for lesson implementation.

5.4. What Are the Problems Faced While Using the Online Learning Environment?

The teacher didn't report a major technical problem while using the online learning environment. For nearly all of the implementations the teacher stated that there were no problems during the implementation of the online learning environment. However, there were some technical problems, one was about Internet connection of

a computer. The problem was about cabling of the computer and the teacher solved the problem. Another technical problem reported by the teacher was heating problem of the projector. The projector was shut down for cooling.

There were also some problems stated by the students. Two students informed the teacher that they were not able to open flash demonstration of a lesson from home. Another two students from a different section reported that they were not able to connect to the OLE from home.

The computer teacher also stated some classroom management problems that he faced. Although the teacher didn't face classroom management issues most of the time, there were two lesson hours that the teacher had considerations about the noise because of the discussion environment during the lesson. The first noise consideration was related to group working in one lesson. The lesson was aimed to assign teacher-student and learner-student roles to students and provide students an environment that teacher-students explaining the lesson topic to their computer-mates. During another lesson, while students were preparing their presentations, some students finished their presentations earlier than others and started to talk each other. This situation classified as very normal by the teacher. The teacher warned those students to be silent.

Similarly the teacher had considerations about the timing of two lessons. For example, close to the end of one lesson, the teacher noticed that there were six groups to present but there was not enough time all of them to present. The teacher solved the problem by omitting the short discussion sessions after each presentation. Similarly, for another lesson the teacher was not sure whether one class hour would be enough for the specific lesson or not. The teacher stated that he figured out close to middle of the lesson that the timing of the lesson was going well.

5.5. What Are the Expectations From an Online Learning Environment?

The present pages/functions of the implemented online learning environment were evaluated in general as having sufficient information share (content explanation) and implementation (well-prepared demonstrations in general), simple and appropriate for students' level, having a unity by the computer teacher. The teacher used many pages of the online learning environment.

There are some criticisms related to the implemented online learning environment and therefore some expectations for a better learning environment. The teacher criticized the information share pages of learning gains (6.3.2 and 6.3.4) as having poor content explanation. For example, the teacher stated that "subject explanation could be simplified..." and "... there could be much oppositeness for explaining the subject so that students could make sense of the topic easier" considering the learning gain 6.3.4. The teacher underlined that there could be more examples in content explanations. The teacher pointed out that although content explanation pages were good enough, there could be more examples on some learning gains. The teacher detailed that some topics require more examples, sometimes contradictory examples for students' understanding of the topic.

There was only one demonstration that didn't match with teacher's lesson. For the learning gain 6.4.4, the demonstration provided by the OLE was explaining Photoshop; but, the teacher stated that he didn't have computers that Photoshop installed. Therefore instead of directing his students to watch the demonstration from the OLE, he demonstrated the MS-Publisher from projector. The teacher also criticized the evaluation pages of the online learning environment. For example, the teacher stated that evaluation criteria for evaluating presentations could be provided in the OLE. The teacher didn't find the evaluation pages as interactive.

Based on the results, expectations from such an online learning environment are discussed. The teacher's expectations are mainly about content explanation and

evaluation pages. The teacher didn't have any clearly specified expectations about implementation pages (or demonstrations).

In general the teacher was satisfied with information share (content explanation) pages and used them frequently. On the other hand, the teacher criticized the examples provided in content explanation pages. The results show that in general the teacher expects more examples to be presented and discussed in information share pages. Examples should present different perspectives and provide contradictory points. Content explanation of learning gains should not be too much complex and detailed.

The teacher indicated that evaluation pages could be much attractive and interactive. There could be different kinds of evaluation activities. For example, matching activities, some interactive flash animations or some kinds of group projects could be presented instead of asking questions in a classic way. The results showed that teacher rarely directed his students to the evaluation pages of the OLE. Instead, he preferred asking questions from it, or printed the questions for short quizzes. Therefore, the teacher wanted some interactive evaluative learning materials that he can present to the students. For example the teacher explained that "there can be a page for students to evaluate the presenters online. For example, listeners can give scores to the presenters and at the end of the lesson best presenters can be chosen" The teacher made this comment for considering it instead of printed presentation evaluation forms.

Finally, for some lessons the students wanted to perform some other operations of software. For example, a student wanted to insert a music file to his/her presentation where the aim or task of the lesson was not related to inserting music files. The teacher pointed out that "the OLE could also provide some tips, or a search property for doing such operations". Therefore, it was an expectation from the OLE for providing an effective search property, or providing related tips for some lessons.

5.6. What Are the Perceptions of the Computer Education Teacher About Integration and Use of Technology and Online Learning Environments by Other Subject Area Teachers?

The results show that the computer teacher was positive about other subject area teachers' technology integration. The results indicate that other subject area teachers' are not expected to have major technical and classroom management problems during integration process. However, the majority of other subject area teachers might need technical support. Moreover, Top (2007) discussed that lack of technical support is one of the main barriers in teachers' technology integration process. Although, political actions and investment projects (providing computers and software with fast internet connections) reported by MoNE (2005c) inadequacy technical infrastructure of schools are still being emphasized by many studies. For example, technical infrastructure of schools was also came out to be another barrier according to the study done by Top (2007). The presence of technological infrastructure was listed to be the first step and a prerequisite by Barnett (2000) for technology use. Ringstaff and Kelley (2002) propose that teachers to be able to access technological resources for successful integration of technology in curricula. The computer teacher reported that he was rarely asked to manage computer laboratories or classrooms by other subject area teachers. The teacher stressed that when the number of such teachers [*requesting to use computer laboratories or use technology in their classrooms*] increases, the existing computer laboratories and computers and computer equipments will not be enough to meet the demand. Therefore, new infrastructure and new investments will be required. The infrastructure of schools is a major discussion in many of the studies in Turkey although there were continuous investments made by MoNE. For example, Akbaba-Altun (2006) reports that schools don't have capable technology. The author especially underlines low number of computers and poor Internet connections, and related equipments and software.

The importance of administrators' role in use and integration of technology into education is addressed by some researchers (Robbins, 2000; Wilmore & Betz, 2000; Top, 2007). The results provided that school administrations are believed to support other subject area teachers' technology integration process. However, there are some research demonstrating negative perspectives about the principles and administrators of schools. For example, Özdemir and Kılıç (2006) pointed out that computer laboratories and technological equipments are not very easy to be accessed by teachers. The quotation from the authors might help to show the severity of situation "many of the principals kept the ICT classrooms under lock and key to protect against theft, damage or improper use of the computers, printers, scanners, video equipment and multimedia software" (Özdemir & Kılıç, 2006, p. 910).

The results indicate that authorities might start an extensive project for developing materials for other subject area teachers to use in their lessons. Molenda (2005) expressed that "one of the largest challenges of educational technology is to ensure that well developed instructional materials and systems are actually placed into use" (p. 19). Furthermore, Sandholtz et al. (1997) claims that "evidence also exists that technology will have a stronger impact when technology integration is part of a broader-based reform effort" (p.9, cited in Sivin-Kachala & Bialo, 2000). A similar pre-condition about reforming teaching strategies for integration of technology was expressed by Barnett (2000). The computer teacher believed that other subject area teachers cannot find materials to use in their lessons. Top (2007) discussed similar issue and concluded that for integration of technology in lessons teachers should be provided materials and activities or online sources that provide such materials. On the other hand, results indicate no sharp perspective about whether other subject area teachers are able to develop their own materials or not.

The computer teacher stressed the importance of taking students' interest and increasing their motivation. It was found that use of animations/simulations can increase students' interest in lessons so students can be much active in the teaching/learning process. Not only the animations, but also presence of technology

and using the technology in lessons are related to students' interests and motivation. The computer teacher's thought can be summarized as the presence of technology in lessons and interactive/interesting/funny materials possibly increase students' interests and motivations towards lessons and increasing students' interests towards lessons affects the students' learning process in a positive way.

5.6.1. What Are the Required Steps/Processes in Order Other Subject Area Teachers to Use and Integrate Technology and Online Learning Environments Into Their Curriculum?

The computer teacher stated that "first, there must be well-developed content and rich materials including appropriate visuals. Second, teachers should be familiar with computers and using computers and they should have experience with using online learning environments. Third, other subject area teachers' curriculum-load and load of their course hours (workload) should be decreased".

Learning Materials

The computer teacher stressed the importance of learning materials for a successful integration. Moreover, it was seen that taking students' interest and increasing their motivation towards lesson are important, too. According to the computer teacher an online learning environment should have high quality visual materials, and enable interactive evaluations. Therefore, the results indicate that for a successful integration an online learning environment should provide learning materials that attract students' interest and so increase their motivation.

Continuous Training and Experience

Top (2007) found that public high school teachers need to develop their technology skills. Moreover, the results are consistent with the Top's (2007) proposition that "these teachers should be trained through by providing in-service training on how to use these technologies or through training environments where they could practice

using technologies for educational purposes in real settings while, at the same time, they may learn use of these technologies” (p.144). Tezer and Karasel (2009) found that teachers’ competency about technology is low and their use of technology is not enough, therefore, in-service seminars should be provided. The importance of training teachers both for technology skills and using technology for their lessons are addressed by variety of studies (Guoyuan, Valcke, Braak, & Tondeur, 2010; Gulbahar, 2007; Ringstaff and Kelley, 2002; Silverstein, Frechtling, & Miyoaka, 2000; Barnett, 2000; Butzin, 2000; Office of Technology Assessment, 1995). Moreover, Sivin-Kachala and Bialo (2000) report teacher training as the most significant factor, which was expressed as a key factor (Mann, Shakeshaft, Becker, & Kottkamp, 1999), in successful integration of educational technology. Schacter (1999) narrow downs the general relationship of use of technology and teacher training to student achievement and teacher training. Schacter (1999) concludes that student achievement increases when teachers were trained how to use technology. According to Barnett’s (2000) sorting, staff (teachers) development is the second prerequisite (the first one is a solid infrastructure) for using technology.

Workload and Load of Curriculum

Decreasing load of their curriculum and load of their course-hours were the third step for integration of online learning environments by other subject area teachers. Heavy teaching loads -as load of course-hours in (Top, 2007) - or -as heavy workload in (Cakiroglu & Cakiroglu, 2003)- of teachers are mainly discussed by the authors researching in Turkey. However, the load of teachers’ curriculum was not discussed by Top, but additional factors were listed as lack of encouragement and promotion, lack of strategy in technology integration in schools and lack of materials.

5.7. Conclusion

The following conclusions can be drawn at the end of the study:

- 1) The teacher, in this study, used the online learning environment to support his instruction during the implementation. Among the many pages, implementation pages were mainly used by the teacher. Information share (or content explanation) as also frequently used by the computer teacher.
 - a) The present pages/functions of the implemented online learning environment were evaluated in general as having sufficient information share (content explanation) and implementation (well-prepared demonstrations in general), simple and appropriate for students' level, having a unity by the computer teacher
 - b) more examples should be presented and discussed in information share pages,
 - c) evaluation pages could be much attractive and interactive instead of presenting solely questions.
- 2) Use of the online learning environment enabled (a) sparing more time for dealing with students individually, (b) providing other information source for students, (c) increasing students' motivation and interest to the lesson.
- 3) Use of online learning environments was utilized for (a) preparing and supporting content of his lessons, (b) preparing and providing alternative examples, (c) preparing evaluation for his lesson and (d) assigning homework for students.
- 4) Integration and use of online learning environment was affected by (a) content of lesson, (b) content provided by online learning environment and (c) learning materials.

- 5) The teacher's use of the online learning environment was mainly based on the implications of cognitive approach, but also implications from constructivist perspective are also adopted.
- 6) The results showed that integration of online learning environment affected learning process by saving time and enabling teacher individually deal with students, increasing participation to activities and discussions, and increasing self-confidence of students.
- 7) The students were perceived to
 - a) have feelings of responsibility of their own learning with the use of online learning environment,
 - b) become aware of reaching information from other source(s),
 - c) be much active and their participation was increased especially with the presence of visuals and interesting learning materials.
- 8) Other subject area teachers are perceived to
 - a) need technical support for using technology,
 - b) have problems because of the technological infrastructure of schools
 - c) need learning materials to use in their classrooms
- 9) The steps needed to be taken in order for other subject area teachers to use and integrate technology and online learning environments into their curriculum are
 - a) in-service training about developing technology skills of teachers
 - b) in-service training about how to integrate technology into lessons
 - c) well-developed content and rich materials including appropriate visuals are important for successful integration of technology,

- i) it is important to provide learning materials and content that are attractive/interesting/motivating for students
- d) teachers' load of curriculum and load of course-hours (workload) are heavy for using technology in their courses.

5.8. Implications and Suggestions For Practice

This study aimed to understand the use and integration of online learning environment by a computer teacher. The following recommendations and suggestions have been offered for similar context, teachers and other practitioners.

- 1) Online learning environments should be supportive for teachers' lessons. In this study the teacher benefited much from implementation pages of the online learning environment. Online learning environments should provide appropriate materials for teachers to use in their lessons.
- 2) The online learning environment used in this study should be revised in the light of the computer teacher, who had practices with it. For example, most of the time evaluation pages of the OLE were suggested to be developed towards much interactive style.
- 3) With the collaboration of universities, schools, MoNE and private sector an extensive project might be initiated. The project might focus on developing instructional learning materials that aims to support technology use in classrooms. MoNE might coordinate institutions and schools to provide an environment that universities support schools about both theoretic and practical issues of technology and its' use.
- 4) For using technology in curriculum, teachers should be provided continuous in-service training about developing their technology skills and about how to use

technology in lessons. Learning materials should be provided for teachers. Moreover, teachers' workload and their curriculum load should be decreased.

- 5) Without adequate technological equipments technology use continues to stay at low levels. Schools are still lack of enough technological infrastructures. Therefore, MoNE should continue to invest on developing technological infrastructure of schools. Moreover, computers and related equipments should be kept up-to-date.

5.9. Recommendations for Further Research

Integration of technology and use of online learning environments are supported, encouraged by universities, policy makers and the research literature has been pursuing effective uses of technology in education. This study tried to understand the integration and utilization process from a computer teachers' perspective. The following research studies are recommended

- 1) This study focused on integration process from teachers' perspective. Another study might focus students' perspective, how students perceive presence of online learning environment, how they feel the new teaching/learning process, how they evaluate the content and materials of online learning environments, and how they perceive effects of OLEs to their learning and self-concept. Therefore, the utilization process can be analyzed in depth.
- 2) The online learning environment of this study was not customizable by the computer teacher, another study might provide an environment that enables teacher to change content and add other learning materials so that how a teacher enhances the teaching/learning process and what types of learning materials are preferred for what types of lesson content could be pursued.
- 3) Throughout this study, the importance of evaluation was underlined most of the times. Role of evaluation in teaching and learning process, teachers' and

students' perceptions about evaluation, purposes evaluation and evaluation techniques of teachers might be pursued so that learning materials that intend to promote use of technology could be developed.

- 4) In this study the learning materials and content of lesson were provided to the computer teacher. Another study might focus on how computer teachers (and also other subject area teachers) develop their own materials and therefore processes of material development might be understood. In other words, the purposes, considerations, expectations, and perceptions of teachers from learning materials could be revealed. The role of the learning material in teaching/learning process, types of learning materials and their implementation in classroom use can be pursued.
- 5) The above questions might be investigated from students' perspective. What students' expect from learning materials, what are their perceptions and evaluations of existing materials, how do they feel about different types learning materials could also be investigated.
- 6) An educational portal could be developed by universities or MoNE for teachers to share their experience, knowledge, materials and problems. Investigating, teachers' use of such portal and the communication could be investigated to reveal practical implications from a wide range of teachers.
- 7) Existing online learning environments could be compared and evaluated for developing features, objectives, purposes of such environments from academics', teachers' and students' perspectives so that a common vision and guidelines of creating online learning environments could be developed.

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APPENDIX A

INTERVIEW GUIDE FOR THE COMPUTER EDUCATION TEACHER ABOUT THE IMPLEMENTATION OF THE LESSON

Merhaba değerli öğretmenim,

ODTÜ Bilgisayar ve Öğretim Teknolojileri Eğitimi Lisansüstü programında doktora eğitimimi sürdürüyorum. Bir çevrimiçin öğrenme ortamının müfreata nasıl entegre edildiğine yönelik bu çalışmaya katıldığınız için teşekkür ederim. Görüşme soruları sizin müfredatınızda kullandığınız çevrimiçi öğrenme ortamı ve bu ortamın dersiniz kapsamındaki kullanımınıza yönelik izlediğiniz yöntemleri, tecrübenizi ve düşüncelerinizi öğrenmeye yöneliktir. Görüşme yaklaşık 30-40 dakika sürecektir. Görüşmeyi analiz etmeyi kolaylaştırmak amacıyla yapacağımız görüşme kayıt edilecektir.

Yapacağımız görüşme tamamen araştırma amaçlı kullanılacaktır ve çalışma süresince ve çalışma sonrasında üretilecek dokümanlarda isminiz kullanılmayacaktır. Sormak istediğiniz herhangi bir soru yoksa görüşmeye başlamak istiyorum.

1) Çevrimiçi öğrenme ortamını kullandığınız sınıf ve işlediğiniz konular hakkında aşağıdaki genel bilgileri verebilir misiniz?

Uygulanan Sınıf:	(örnek: ilköğretim 4. sınıf, 6 sınıf gibi)
Uygulanan Basamak:	(örnek: 5. basamak, 6. basamak gibi)
Uygulanan Ünite:	(örnek: 5. basamak için ünite 1 “Internet Adresleri” gibi)
Kazanımlar:	(örnek: 5. basamak 1. ünite için 1.1. , 1.2, 1.3, 1.4, 1.5)

- 2) Sınıf içerisinde dersinizi nasıl işlediniz? Süreçleri mümkün olduğu kadar adım adım belirtebilir misiniz?
- a) Hangi aşamalarda çevrimiçi öğrenme ortamını kullandığınızı belirtebilir misiniz?
 - b) Mümkün olduğu kadar hangi aşamaya ne kadar vakit ayırdığınızı da belirtebilir misiniz?
 - c) Çevrimiçi öğrenme ortamını hangi amaç(lar) için kullandığınızı açıklayabilir misiniz?
 - i) Bu amaç ya da amaçların ne kadarını gerçekleştirebildiğinizi düşünüyorsunuz?
 - d) Eğer çevrimiçi öğrenme ortamını kullanmadıysanız, ya da çok az yer verdiyseniz bunun nedenini açıklayabilir misiniz?
 - e) Çevrimiçi öğrenme ortamını sınıfdışı aktiviteler için de kullandınız mı?
 - i) Eğer kullandıysanız, hangi amaca yönelik olarak tercih ettiğinizi belirtebilir misiniz?
 - f) Bu sınıfta uyguladığınız ünite ve basamak çerçevesinde çevrimiçi ortamı nasıl değerlendirirsiniz?
 - i) Bu sınıfta uyguladığınız basamak ve ünite çerçevesinde çevrimiçi ortamın artıları ve eksileri nelerdir?
- 3) Çevrimiçi öğrenme ortamının kullanımı süresince gözlemlerinize dayanarak öğrencilerinizin davranış ve tepkilerini belirtebilir misiniz?
- a) Genel olarak sınıfınızdaki öğrencilerin çevrimiçi ortamı nasıl algıladığını düşünüyorsunuz?
- 4) Çevrimiçi öğrenme ortamını kullanırken herhangi bir teknik problemle karşılaştınız mı?
- a) Bu teknik problem doğrudan sitenin çalışması ile ilgili midir?
 - b) Bu teknik problem laboratuvarında yaşadığınız bir teknik problem midir?
 - c) Yaşadığınız bu sorunu çözebildiniz mi?
- 5) Çevrimiçi öğrenme ortamını sınıf içerisinde uygularken sınıf yönetimi konusunda herhangi bir sorunla karşılaştınız mı?
- a) Öğrencilerin başka şeylerle ilgilenmesi, öğrencilerin fazla gürültü çıkarması, ya da sizin ya da öğrencilerin olası dile getirilen şikayetlerinden bahsedebilirsiniz.
- 6) Genel olarak dersiniz süresince gözünüze çarpan noktaları belirtebilir misiniz?

- a) Öğrencilerinizin değişik tepkileri, bu sınıfın diğer sınıflarla kıyaslandığında ortaya çıkan farklı durumlar, ya da doğrudan sizin bu sınıfa özel olarak yaşadığınız tecrübeleriniz olabilir.
- 7) Genel olarak bu sınıfta işlediğiniz ünite ve kazanım doğrultusunda bu dersinizi nasıl değerlendirirsiniz?
- Açıklama: Öğretmenim bu bölümde bugün ilgili sınıfla işlemiş olduğunuz dersi değerlendirmenize düşüncelerinizi öğrenmek istiyorum. Diğer taraftan işlediğiniz dersinizi tartışmaya açmak istiyorum.
- a) Bu değerlendirmenizi daha önceki tecrübelerinizle kıyaslama yaparak,
- i) Bu sınıfın bir önceki dersi ile karşılaştırma yaparak,
- b) İşlediğiniz konu ve çevrimiçi öğrenme ortamını değerlendirerek,
- c) Beklentilerinizi detaylandırarak,
- d) Ders işlenişi sırasında gözlemlediğiniz olumlu/olumsuz durumlardan bahsederek,
- e) Çevrimiçi öğrenme ortamının dersinizin işlenişi ile ilgili olan ilişkinden bahsederek,
- f) Takip eden derslere yönelik görüşlerinizi belirterek,
- i) Bugünkü ders işleyişinizi değerlendirerek bu sınıfın bundan sonraki dersine yönelik ders işlenişine yönelik; öneri, beklenti, çekince vb. düşüncelerinizi açıklayabilir misiniz?
- 8) Sizin eklemek istediniz düşünceleriniz, bahsetmediğimizi düşündüğünüz konular var mı?

Katıldığınız ve ayırdığınız zaman için çok teşekkür ederim.

APPENDIX B

INTERVIEW GUIDE FOR THE COMPUTER EDUCATION TEACHER ABOUT USE OF ONLINE LEARNING ENVIRONMENT BY OTHER SUBJECT AREA TEACHERS

Merhaba değerli öğretmenim,

ODTÜ Bilgisayar ve Öğretim Teknolojileri Eğitimi Lisansüstü programında doktora eğitimimi sürdürüyorum. Bir çevrimiçi öğrenme ortamının müfreata nasıl entegre edildiğine yönelik bu çalışmaya katıldığınız için teşekkür ederim.

Görüşme soruları bir çevrimiçi öğrenme ortamının genel olarak sizin tarafınızdan ve diğer alan öğretmenleri tarafından kullanımına yönelik tecrübelerinizi ve düşüncelerinizi edinmeye yöneliktir. Görüşme yaklaşık 30-40 dakika sürecektir. Görüşmeyi analiz etmeyi kolaylaştırmak amacıyla yapacağımız görüşme kayıt edilecektir.

Yapacağımız görüşme tamamen araştırma amaçlı kullanılacaktır ve çalışma süresince ve çalışma sonrasında üretilen dokümanlarda isminiz kullanılmayacaktır. Sormak istediğiniz herhangi bir soru yoksa görüşmeye başlamak istiyorum.

- 1) Genel olarak böyle bir çevrimiçi öğrenme ortamından beklentilerinizi belirtebilir misiniz?
 - a) Başka hangi fonksiyonların olmasını beklerdiniz?
 - b) İçeriği göz önünden bulundurursanız, başka hangi bölümlerin olmasını isterdiniz?
 - i) Ders işlemenize yardımcı olabilecek olası bölümleri açıklayabilir misiniz?

- ii) Öğrencilerinizin ilgisini çekebilecek bölümlerden bahsedebilir misiniz?
- 2) Sizce diğer alan öğretmenleri (matematik, tarih, türkçe, gibi) benzer bir çevrimiçi nasıl kullanabilirler?
- a) Benzer bir çevrimiçi öğrenme ortamı derslerine nasıl entegre edebileceklerini düşünüyorsunuz?
- b) Diğer alan öğretmenleri benzer bir çevrimiçi öğrenme ortamını kullanırken nasıl sorunlarla/problemlerle karşılaşabilirler?
- 3) Diğer alan öğretmenlerinin benzer bir çevrimiçi ortamı faydalı bir şekilde kullanabilmeleri için neler gereklidir?
- a) Diğer alan öğretmenlerinin benzer bir çevrimiçi ortamı kullanabilmeleri için gereksinimleri tanımlayabilir misiniz?
- i) Hem öğretmen açısından hem de içerik açısından değerlendirebilir misiniz?
- ii) Entegrasyon için gerekli öncelikleri, adımları tanımlayabilir misiniz?
- 4) Sizin eklemek istediniz düşünceleriniz, bahsetmediğimizi düşündüğünüz konular var mı?

Katıldığınız ve ayırdığınız zaman için çok teşekkür ederim.

APPENDIX C

INTERVIEWS CONSENT FORM

Gönüllü Katılım Formu

Yapacağımız görüşmeler yürütülmekte olan doktora tezinin veri toplama araçlarıdır. Çalışma bilgisayar öğretmeninin bir çevrimiçi öğrenme ortamını müfredatına nasıl entegre ettiğini ve nasıl kullandığını/faydalı hale getirdiğini anlamaya çalışmaktadır.

Görüşmelere katılım tamamen gönüllüdür. Görüşmede kimlik belirleyici hiçbir bilgi istenmemektedir. Vereceğiniz bilgiler sadece araştırma amaçlı kullanılacak, ortaya çıkacak belge ve yayınlarda isminiz doğrudan veya dolaylı olarak kullanılmayacaktır.

Görüşme kişisel rahatsızlık verecek sorular içermemektedir. Yine de görüşmede bir sorudan ya da herhangi başka bir sebepten rahatsız olursanız, cevaplamayı yarıda bırakabilirsiniz. Çalışmaya katıldığınız için şimdiden teşekkür ederiz.

Çalışma hakkında daha fazla bilgi almak için Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü doktora öğrencisi Levent Durdu (Tel: 533 5404002; e-posta: dlevent@gmail.com) ile iletişim kurabilirsiniz.

Bu çalışmaya tamamen gönüllü olarak katılıyorum ve istediğim zaman yarıda kesip bırakabileceğimi biliyorum. Verdiğim bilgilerin bilimsel amaçlı yayınlarda kullanılmasını kabul ediyorum.

Tarih		İmza	
----/----/----		Adı Soyadı	

(Formu doldurup imzaladıktan sonra uygulayıcıya geri veriniz).

APPENDIX D

INTERVIEW CITATIONS OF THE TEACHER

[T-1]: Bir işlemin/prosedürün, örneğin bir dokümanın kaydedilmesi, ya da yeni bir slayt oluşturulması, nasıl yapıldığını ben gösterdiğimde, önceden, konuyu anlamayan, teknik sorunlar yaşayan, ya da benim demonstrationımı çok yavaş izleyen öğrenciler tarafından genellikle bölünüyordum. Bu durum, yapmakta olduğum gösterimi tamamen durdurup baştan başlamamı ya da bu öğrencilere ‘gösterimi bitirdikten sonra yardım edeceğimi’ söylememe neden oluyordu. Diğer taraftan, aslında benim yerime gösterim yapan öğrencileri çevrimiçi öğrenme ortamına yönlendirdiğim zaman, iki tür öğrenci grubum oldu. Bazıları demoyu izleyip problemsiz biçimde verilen görevi yapanlar ve verilen görevi yapamayanlar. Bu nedenle, ikinci gruptaki öğrencilere bireysel olarak ilgilenebilmek için vaktim oldu. Dolayısıyla, diğer öğrencileri bekletmeden her öğrenciye yardım edebildim.

[T-2]: Aslında, iki gösterimin de az çok aynı süreyi aldığını söyleyebilirim. Ancak, önemli nokta şu, ben gösterim yaptığımda çoğu zaman bölündüğümü hissediyordum. Diğer taraftan, öğrenciler bireysel olarak çalıştıklarında, ben işlemleri yapma konusunda problem yaşayan öğrencilere yardım edebildim. Sonuç olarak, OLE tarafından sağlanan gösterimleri tercih ederim.

[T-3]: Kelime işlemci programı ile sunum programı arasındaki farkları açıkça tartıştığımızı düşünüyordum. Diğer taraftan, öğrencinin vurguladığı fikir de tamamı ile yanlış değil. Bazı zamanlar Word’ü slaytlara sığmayan dikey resimleri göstermek için kullanıyoruz. Bu nedenle, kelime işlemci programının ve sunum programının amaçlarını sınıfça tekrar tartıştık. Okunabilirlik kavramını ve okunabilirliğin önemini ayrıca sundum. Uzun bir metni hem Word dokümanı olarak hem de sunum olarak gösterdim ki ikisinin arasındaki görsel fark açıkça görülsün. Ayrıca, bir sunumda ana amacın esas fikri ya da uzun bir metnin özetini vermek olduğunu, ancak bir Word dokümanında insanların daha detaylı okunması için uzun metin verilebileceğini açıkladım.

[T-4]: Şimdi, verilen bir işlemi yaparken zorlanan öğrencilere daha fazla zaman ayırabiliyorum. Ayrıca, terimleri ve kavramları tartışarak öğrenme sürecinde daha aktif oluyorsunuz.

[T-5]: Öğrenciler, söylediklerimi gerçekten anladılar mı bilmiyorum, ama bir şekilde bu şekildeki öğretme-öğrenme şeklinin daha iyi olduğuna ikna oldular.

[T-6]: Buna bir çözüm buldum, adımları öğrencinin sunumu üzerinde göstermek yerine yeni bir sunum oluşturdum ve adımları bu yeni dokümanda gösterdim. Böylece öğrenciler, adımları onların yerine yapmayacağımı bunun yerine benim rehberliğimin resim ekleme işlemini, ya da slaytın tasarımını değiştirmenin adımlarını göstermek olduğunu açıkça anlayabilsinler istedim.

[T-7]: Öğrencilerimin OLE'yi kullanmaya alıştıklarını gözlemledim. Ayrıca, kendilerine olan güvenlerinin arttığına inanıyorum, çünkü öğretmene sormadan da bir işlemi tamamlayabileceklerini ve öğrenebileceklerini biliyorlar. İlgimi çeken diğer bir nokta ise, sınıf tartışmalarına daha fazla katılım vardı. Tahmin ediyorum ki öğrenciler herhangi bir şey kaçırmayacaklarını biliyorlardı. Yani, her zaman ihtiyaç duyduklarına OLE'ye başvurabileceklerini biliyorlar. Örneğin, bazen yaptıkları şeyi durdurup, sınıftaki tartışmaya dahil oldular, ya da beni dinlediler, sonrasında işlerine geri döndüler. Başka bir nokta ise bir tartışma olduğunda, ilginç bir şekilde bazı öğrenciler OLE'den cevaplar verdiler, bazıları da doğrudan OLE'den okudu.

[T-8]: Evet, bu hem 4A hem de 4B grubunda oldu. Çünkü, her düzeyde ve sınıfta bilgisayarla haşır neşir olan çocuklar vardır ve diğer programlarla ilgili tecrübeleri vardır. Bu nedenle, böyle öğrencileri görmek normal. Benzer şekilde, matematik dersinde toplayabilen, çarpabilen, bölebilen ve hesaplama yapabilen ve diğer öğrencilerden daha hızlı bir şekilde problemleri çözebilen öğrenciler olabilir. Bilgisayar dersi bir istisna değil.

[T-9]: Açık konuşmam gerekirse, bu durum herhangi seviyede ya da sınıfımda sıkça olur. Bu durum bir problem olarak tanımlanamaz. Daha önceden örneğini verdiğim gibi, matematik dersinde de bazı öğrencileri problemleri diğerlerinden daha hızlı çözdüğünü düşünmelisin. Aslında, matematik dersi yavaşlar düşünüldüğünde dezavantajı olan bir ders. Matematik dersinde bir kaç öğrenci bir problemi çözünce ve öğretmen bunları öğrencileri görünce öğretmen problemin çözümünü gösterir. Diğer öğrenciler yani yavaşlar, problemle ilgilenmeyi bırakırlar ve öğretmeni izlerler çünkü öğretmen çözümü göstermektedir. Bir matematik ya da fizik dersinde öğretmenin öğrencilerle bireysel olarak ilgilendiğini yardım ettiğini göremezsiniz ya da çok nadir görürsünüz. Diğer taraftan, bilgisayar dersinde çoğunlukla bir bilgisayar öğretmenin bireysel olarak öğrenciye yardım ettiğini yönlendirdiğini görebilirsiniz. Öğrenciler de bu avantajın farkındalar yani bir sorun yaşadıklarında öğretmenin

onlara yardım edeceğinin yönlendireceğinin. Ayrıca, bizim durumumuzda ödevin adımlarını gösteren OLE var. Bu nedenle, öğrenci bir adımı unuttuğunda yardım alabileceği bir bilgi kaynağının olduğunu biliyor.

[T-10]: Yaptıklarını gözlemlemek ve ihtiyaç duyduklarına yardım etmek için sınıfta dolaştım. Bir şeyin nasıl yapılacağını unuttuklarında OLE' ye başvurabileceklerini ayrıca önerdim.

[T-11]: Çoğu öğrencinin sunum programını kullanırken rahat olduklarını gözlemledim. Sunumlarını hazırlarken çok problem yaşamadılar. Çoğu öğrenci sunumlarını yardıma ihtiyaç duymadan bitirebildi. Bazı öğrenciler adımları hatırlamak için OLE' ye başvurdular. Bazıları ise benden yardım istedi.

[T-12]: Bugün, konularınızı sunacaksınız. Hatırlarsanız, geçen hafta dosyalarınızı bilgisayarlarınızdan kopyalamıştım. Dosyalarınızı kendi bilgisayarına kaydettim ki projektör ile sunumlarınızı yapabilesiniz. Gönüllüler ile başlayabiliriz. Sunmak isteyen var mı?

[T-13]: Örnek üzerinden göstererek, içerik slaytına geri dönüşün ya da istenilen bir başlığa içerik slaytından erişimin köprüler kullanmadan zor olduğunu gösterdim. Sonrasında, köprülerle bu işin ne kadar kolay olduğunu gösterdim.

[T-14]: Süre dolduktan sonra, öğretmen öğrenciler bilgisayar arkadaşlarının yanına döndüler. Öğretmen öğrenciler arkadaşlarına öğretmeye başladılar. Onları öğretmen rolünde izlemek benim için eğlenceli bir deneyimdi. Öğretmen öğrencilerin yorumları 'öğretmenim anlamak istemiyor', 'beni dinlemiyor', 'yanlış yapıyorlar' gibi.

[T-15]: Bildiğin gibi benim ilk endişem gürültü idi, ancak gürültüden çok fazla rahatsız olmadığımı hissettim. Normal bir dersten fazlaydı fakat benim beklediğimden azdı. Sınıfa sessiz olmalarını nadiren söylemek ihtiyacını duydum.

[T-16]: Normal ders saatinde bile 25'ten fazla öğrenci ile ders işlemek bir sorun. Şimdi biz birbirleri ile konuşmalarını sağlamaya çalışıyoruz. Sınıfta oluşacak gürültüyü hayal bile edemiyorum.

[T-17]: Yıllardır bazı kalabalık sınıflara giriyorum ancak daha önce böyle bir stratejiyi düşünmemiştim. Böyle bir stratejiyi ya da benzer bir varyasyonunu diğer sınıflarımda da kullanmayı düşünüyorum.

[T-18]: Evet, dersin ortalarına doğru sürenin yeterli olup olmayacağını düşündüm. Ancak, böyle bir ders tecrübem olmadığı için olduğu açıkmiş. Bu nedenle normal bir düşünce.

[T-19]: Bugünkü derse benzer şekilde iki aşamada öğrencilere roller atayabilirim. İlk bölümde seçtikleri müzisyen hakkında araştırma yapabilirler, ikinci aşamada

sunumlarını hazırlayabilirler. Bir grubu ele alırsak, bir öğrenci bilgisayarı kullanarak bilgi ve resim araştırabilir, diğer öğrenci de ellerindeki bilgiyi yazabilir. İkinci aşamada sunumlarını hazırlamaya başlayabilirler. Bir öğrenci bilgisayarı kullanabilir, slayt ekler, metin girer, diğer bilgileri hatırlatır ve resimleri hatırlatır.

[T-20]: Bugün sevdiğiniz bir müzisyenle ilgili sunum hazırlayacaksınız. Geçen hafta olduğu gibi gruplar halinde çalışacaksınız. Grup olarak göreviniz bilgi ve resim, müzik, ya da video araştırmak. Sonra sunumlarınızı hazırlayacaksınız. Sunumlarınızı bugünkü ders saati içerisinde bitirmeniz gerekiyor. Haftaya ise sunumlarınızı sunacaksınız.

[T-21]: Öğrencilere cevap için OLE' ye bakmalarını söylemedim, bunun yerine kendim cevapladım çünkü OLE' den izlemekten daha kısa sürüyordu. Ayrıca, çoğu öğrencinin birbirine yardım ettiğini gördüm. Örneğin, bir gruptaki bir öğrenci bir resme nasıl animasyon verdiklerini öğrenmek için diğer bir grubun yanına gitti. Nasıl animasyon verileceğini öğrenince kendi bilgisayarındaki arkadaşına açıkladı.

[T-22]: Her zaman bilgisayarlarla deneyimi olan ve bilgisayarları kullanabilen ya da bazı programları, işlemleri çabuk öğrenen birkaç öğrenci vardır. Bu nedenle, bu öğrenciler bir şeyin nasıl yapılacağını bulduklarında ya da farkı ilginç bir çözüm bulduklarında hemen bu bilgiyi arkadaşları ile paylaşıyorlar. Dürüstçe söylemek gerekirse, bu çeşit bilgi paylaşımının nazik bir bilgi paylaşımı amacı taşımadığını söylemek zorundayım, bu davranış bir çeşit gösteriş aslında. Yani, bu öğrenciler, konuyu bildiklerini ya da hızlı öğrendiklerini göstermek istiyorlar.

[T-23]: Öğrenciler için sunum yapanları online değerlendirebilecekleri bir sayfa olabilir. Örneğin, dinleyenler sunanlara puan verebilirler ve ders sonunda en iyi sunum yapanlar seçilebilir.

[T-24]: Ders konusu öğrencilerin gerçek hayatları ile ilgili olduğunda öğrenciler derse ve tartışmalara normalden daha fazla katılıyorlar. Yani, öğrenciler hakkında bir şey söyleyebilecekleri ders konularını seviyorlar diyebilirim.

[T-25]: Bu nedenle, ders konusunu ben anlatmak istedim. Çünkü öğrencilerimin EĞER formülünün mantığını anlamakta zorlanacaklarını biliyordum. Mantığı, örnek vererek ve EĞER algoritmasını tartışarak açıklamaya çalıştım ki öğrenciler EĞER formülünün arkasındaki temel mantığı anlayabilsinler.

[T-26]: Bu normal bir durum. Ders konusu diğer konulara kıyasla biraz daha zor olduğu için bazı öğrencilerin ders konusunu anlamakta zorluk çekeceklerini biliyordum. Bu nedenle öğrencileri OLE' ye yönlendirmek yerine dersi kendim anlatmayı istedim. Konu bir program için işlem yapmayı gerektirdiğinde öğrenciler kolaylıkla OLE demolarını ve açıklamalarını takip edebiliyorlar. Diğer taraftan, eğer işlem EĞER formülü gibi öğrencilerin akıl yürütmelerini gerektiriyorsa, öğrenciler

soru sorma ihtiyacını hissediyorlar ve benim cevaplarıma ve yönlendirmeme göre mantığı anlamaya çalışıyorlar.

[T-27]: Tahmin ediyorum ki öğrencimin bilgisayarında yüklü Flash programı yoktu, ya da bir yazılım sorunu olabilir. Çünkü bu durumu öğrenince diğer öğrencilere benzer bir sorun yaşayıp yaşamadıklarını sordum. Diğer öğrenciler Flash animasyonunu izleyebildiklerini söylediler.

[T-28]: Haftaya çoğunun verilen ödevi çalışarak sınıfa geleceğini tahmin ediyorum. Çünkü çalışmadan geldikleri zaman sınıf içi çalışmayı yaparken sorunla karşılaşacaklarının farkına vardılar.

[T-29]: Öğrencilere arkadaşlarına yardım edebileceklerine dair izin verdim çünkü bu sabah 7C sınıfında öğrencilere tek tek yardım etme konusunda sıkıntı yaşadım. Bunun için normal derslerimdeki gibi kendim demo yapmayı tercih ettim. Fakat 7B grubunda öğrenciler diğer arkadaşlarına yardım etmeleri konusunda izin istediklerinde, kalan öğrencilere de kendim yardım edebilirim diye düşündüm.

[T-30]: Aslında bu konu yani EĞER formülü anlaşılması zor bir konu. Bunun için öğrenciler soru sorma ihtiyacındalar. Ayrıca, EĞER formülü sadece düzgün şekilde yazmakla ilgili değil aynı zamanda EĞER formülünü kullanmanın mantığını anlamakta önemli.

[T-31]: Örneğin, grafik eklemeyi öğrenmek EĞER formülü ile karşılaştırılınca daha kolay. Grafik eklemek için öğrencinin uygun hücreleri seçmesi, ekle menüsüne gitmesi ve bir grafik tipini seçmesi gerekiyor. Diğer yanda, EĞER formülü öğrencilerin test kriterini düşünmelerini ve devamında kriterin sonucuna göre bir eylemde bulunmalarını gerektiriyor. Yani, grafik eklemek sadece uygun hücreleri seçmeyi ve uygun menüye tıklamayı gerektirirken, EĞER formülü akıl yürütmeyi ve doğru yazımı gerektirir.

[T-32]: Öğrenci hemen sunmaya başladı, fakat bir giriş bölümünün olması gerekiyordu, ne zaman koşullu biçimlendirmeyi kullanırsanız, böyle bir fonksiyona neden ihtiyaç duyarız gibi. Bu nedenle öğrenciyi durdurdum ve bu soruları sınıfa sordum. Görsel algılarını destekleyecek iki örneği de ayrıca verdim.

[T-33]: Öğrencilerin konuyu evlerinde çalışıp çalışmadıkları pek fark etmedi, konuyu öğrencilere kendimin açıklaması gerektiğini zorunda hissettim. Çünkü benim anlatımım olmadan konunun arkasındaki mantığı anlamayacaklarını düşündüm. Hangi durumlarda koşullu biçimlendirmeyi kullanabileceklerini bilmelerini istedim. Koşullu biçimlendirmenin adımlarını yapmak kısmen kolay. Diğer taraftan, ne zaman koşullu biçimlendirme kullanılacağına karar vermek daha önemli. Bu nedenle konuyu kendim açıklamak ve tartışmak istedim bu şekilde öğrencilerimin büyük resmi görebildiklerinden emin olabilirdim.

[T-34]: Diğer alan öğretmenlerinin benzer ortamları kullanırken sorun yaşayacaklarını düşünmüyorum. Benim derslerimden bahsetmek ve karşılaştırmak gerekirse, ben OLE'yi kullanırken çok fazla sorunla karşılaşmadım. Diğer alan öğretmenlerinin de benzer şekilde çok sorun yaşamayacaklarına inanıyorum. Bilgisayarları kullanırken, ya da öğretmen bilgisayarını kullanırken, teknik sorunlarla karşılaşabilirler, ama bu durumda da bilgisayar öğretmenin ya da teknik personelin yardımını isteyebilirler. Ayrıca, sınıf yönetimi açısından da sorun yaşayacaklarını düşünmüyorum.

[T-35]: İlk olarak uygun görseller içeren zengin materyallerin ve iyi geliştirilmiş içeriğin olması gerekiyor. İki, öğretmenler bilgisayarlarla ve bilgisayarları kullanmakla haşır neşir olmalı. Üç, ders yüklerinin azaltılabilir ki bu şekilde derslerini teknoloji destekli olacak şekilde planlamak için vakitleri olsun ve ders içeriklerinin yoğunluğu azaltılabilir.

[T-36]: Yeni mezun öğretmenlerin çoğunun bilgisayar derleri aldıklarını ve bilgisayarları kullanmayı biliyorum fakat bazılarının sorsanız bilgisayarları sınıfta nasıl kullanırsınız, pek tatmin edici cevap alamazsınız. Diğer taraftan, derslerinde bilgisayarları ve interneti verimli kullanan öğretmenler de mevcut. Çok az da olsa, dersi için bilgisayar laboratuvarını ne zaman kullanabileceğini soran öğretmenleri de gördüm.

[T-37]: Öğretmenlerin kendi materyallerini geliştirmelerini beklemek pek gerçekçi değil. İlk olarak, bütün öğretmenler nasıl öğretim materyali yapacaklarını ve geliştireceklerini bilmiyorlar. Sonra, ders materyali geliştirmek için yeterli zamanları yok. Bu sebeple, geleneksel kitaplar gibi elektronik materyaller de öğretmenler için kullanıma hazır şekilde geliştirilmelidir. MEB diğer alan öğretmenleri için de benzer bir etkinlikler CD'si hazırlayabilir, ya da bir portal yaratabilir. Bu portal öğretmenlerin derslerini teknoloji kullanımı ile iyileştirmesini destekleyebilir.

CURRICULUM VITAE

PERSONAL INFORMATION

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EDUCATION

Degree	Institution	Year of Graduation
PhD	Computer Education and Instructional Technology, Middle East Technical University, Ankara, Turkey <i>“How Computer Education Teachers Utilize the Online Learning Environment”</i>	2010
MSc	Computer Education and Instructional Technology, Middle East Technical University, Ankara, Turkey, <i>“Web-Based Learning Tool: Design and Development of an Online Basic English Support Material for Young Children at Elementary Level”</i>	2003
BSc	Computer Education and Instructional Technology, Middle East Technical University, Ankara, Turkey	2000

WORK EXPERIENCE

Years	Institution	Enrollment
2008 - 2010	Dept. of Computer Engineering, Doğuş University İstanbul, Turkey	Instructor, Part-Time
2007-2008	ODTÜ – TÜBİKTAK Projesi: Bilimce Bilim Okulları ve Kampları Ankara, Turkey	Coordinator, software development
2000-2007	Dept. of Computer Education and Instructional Technology, Middle East Technical University, Ankara, Turkey	Research Assistant

LANGUAGES

Turkish (Native), English (Foreign)

PUBLICATIONS

Durdu, L., & Özden, M.Y. (2006). How does time spent on CALL software affect students' perceptions? *Proceedings of the Twelfth International CALL Conference: How are we doing? CALL & Monitoring the learner*, 64-72.

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