CONTRIBUTING FACTORS TO SATISFACTION IN AN ONLINE CERTIFICATE PROGRAM: A CASE STUDY

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY

ERMAN YÜKSELTÜRK

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF DOCTOR OF PHILOSOPHY
IN
COMPUTER EDUCATION AND INSTRUCTIONAL TECHNOLOGY

MAY 2007

Approval of the Graduate School of Natural and Applied Sciences

Prof. Dr. Canan ÖZGEN
Director

I certify that this thesis satisfies all the requirements as a thesis for the degree of Doctor of Philosophy.

Prof. Dr. M. Yasar ÖZDEN
Head of Department

This is to certify that we have read this thesis and that in our opinion it is fully adequate, in scope and quality, as a thesis for the degree of Doctor of Philosophy.

Assoc. Prof. Dr. Zahide YILDIRIM
Supervisor

Examining Committee Members

Prof. Dr. Petek ASKAR (Hacettepe Unv., CEIT) _____

Assoc. Prof. Dr. Zahide YILDIRIM (METU, CEIT) _____

Assoc. Prof. Dr. Safure BULUT (METU, SSME) _____

Assoc. Prof. Dr. Kürsat ÇAGILTAY (METU, CEIT) _____

Assoc. Prof. Dr. Soner YILDIRIM (METU, CEIT) _____

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

Name, Last name: Erman Yükseltürk

Signature :

ABSTRACT

CONTRIBUTING FACTORS TO SATISFACTION IN AN ONLINE CERTIFICATE PROGRAM: A CASE STUDY

YÜKSELTÜRK, Erman
Ph. D., Department of Computer Education and Instructional Technology
Supervisor: Assoc. Prof. Dr. Zahide YILDIRIM

May 2007, 162 pages

The main aim of this study is to examine participants' satisfaction with online Information Technologies Certificate Program (ITCP) which is based on synchronous and asynchronous communication methods over Internet offered by cooperation of Computer Engineering Department and Continuing Education Center at Middle East Technical University. There are three main purposes under the main aim. These purposes are to describe the strength and direction of relationship between participants' perceptions of online technologies self-efficacy, online learning readiness, locus of control, prior knowledge, and participants' satisfaction; to analyze contributing factors of participants' satisfaction based on semester 1, 2, 3 and 4 in the online ITCP; and to investigate instructors' and participants' views about satisfaction in online ITCP. The sample includes 62 participants who enrolled and 8 instructors who offered courses in this online program in 2004-2005. A combination of quantitative and qualitative data collection methods are used in this study. The results of the study demonstrate that

participants' initial perception of online learning readiness is only a variable that correlate statistically significant with participants' satisfaction. Although participants' overall satisfaction is generally positive, it decreases over the semesters of the program. Participants are satisfied with learner-instructor interaction and institutional support in the program. However, participants' satisfaction level is low for interaction among participants. Also, participants' satisfaction about course structure and flexibility decrease over the semesters in the program. Moreover, the findings of semi-structured interviews with participants and instructors and chat session and discussion list transcripts reveal complementary results to the statistical analyses.

Keywords**:** Distance education, online learning, student perception, student satisfaction, factors contribute to student satisfaction, information technology.

ÖZ

BIR ÇEVRIM-IÇI SERTIFIKA PROGRAMINDA MEMNUNIYETE KATKIDA BULUNAN FAKTÖRLER: BIR DURUM ÇALISMASI

YÜKSELTÜRK, Erman
Doktora, Bilgisayar ve Ögretim Teknolojileri Egitimi Bölümü
Tez Yöneticisi: Doç. Dr. Zahide YILDIRIM

Mayis 2007, 162 sayfa

Bu çalismanin temel hedefi, Orta Dogu Teknik Üniversitesi, Bilgisayar Mühendisligi Bölümü ve Sürekli Egitim Merkezi ortaklasa düzenledigi Internet üzerinden eszamanli ve eszamansiz iletisim yöntemleri kullanilarak verilen Çevrim-içi Bilgi Teknolojileri Sertifika Programi (BTSP) katilimcilarin memnuniyetini incelemektir. Bu temel hedefin altinda üç amaç vardir. Bunlar, katilimcilarin çevrim-içi teknolojilerdeki öz-yeterliligi, çevrim-içi ögrenmeye hazir olusluk, kontrol odagi, ön bilgisi ve memnuniyeti arasindaki iliskinin yönü ve kuvvetini tanimlamak, çevrim-içi BTSP'nin 1., 2., 3., ve 4. dönemlerindeki katilimcilarin memnuniyetini etkileyen faktörleri çözümlemek, ve çevrim-içi BTSP'deki ögretim üyelerinin ve katilimcilarin ögrenci memnuniyeti hakkindaki görüslerini incelemektir. Örneklem, 2004-2005 yilinda bu programa kayit olan 62 katilimci ve programdaki dersleri veren 8 ögretim üyesini kapsamaktadir. Bu çalismada, nitel ve nicel veri toplama yöntemleri kullanilmistir. Çalismanin bulgulari, katilimcilarin çevrim-içi ögrenmeye hazir olusluk algilarinin, memnuniyetleriyle istatistiksel olarak anlamli iliskisi olan tek degisken oldugunu

ortaya koymustur. Katilimcilarin genel memnuniyetlerinin olumlu düzeyde olmasina ragmen, dönemler ilerledikçe azalmaktadir. Katilimcilar, programdaki ögrenci-egitimci etkilesimi ve kurumsal destekten memnun olmakla beraber, katilimcilarin memnuniyet seviyesi katilimcilar arasindaki etkilesim için düsüktür. Ayrica, programdaki ders yapisi ve esneklikle ilgili katilimcilarin memnuniyeti dönemler ilerledikçe azalmaktadir. Ek olarak, katilimcilar ve ögretim üyeleriyle yari-yapilandirilmis görüsmelerinin, sohbet oturumlari ve tartisma listelerinin suretlerinin bulgulari, istatiksel analizleri dogrulayici sonuçlar göstermektedir.

Anahtar Kelimeler: Uzaktan egitim, çevrim-içi ögrenme, ögrenci algilari, ögrenci memnuniyeti, ögrenci memnuniyetini etkileyen faktörler, bilgi teknolojileri

To My Wife

ACKNOWLEDGEMENTS

First and foremost, I would like to express my deepest gratitude to Assoc. Prof. Zahide Yildirim, my thesis supervisor, for her invaluable guidance, support and encouragement throughout this study.

I would also like to express my deepest gratitude to Prof. Dr. Adnan Yazici, project coordinator of online ITCP, and all other instructors in online ITCPs who encouraged and supported in writing of this thesis.

Then, I would like to express my sincere gratitude and thanks to my examination committee members, Prof. Dr. Petek ASKAR, Assoc. Prof. Dr. Soner YILDIRIM, Assoc. Prof. Dr. Kürsat ÇAGILTAY, Assoc. Prof. Dr. Safure BULUT for their valuable suggestions and comments.

I would like to express my love and deep gratitude to my family, and my loving wife, Sibel Yükseltürk, for their patience, encouragement and unwavering faith in me.

TABLE OF CONTENTS

LIST OF TABLES

TABLE

LIST OF FIGURES

FIGURE

CHAPTER 1

INTRODUCTION

The recent emergence of technologies such as the World Wide Web and online communication tools allow universities offer distance education programs to meet the needs of nontraditional students. With the help of these technologies, the number of online courses, online programs are increasing drastically in the recent years. Also, it is expected that the number of online students will grow in the long-term (Allen & Seaman, 2004). A variety of positive aspects is attributed to this type of distance education, especially online education. The major advantages are greater flexibility of both class time and space, expanded potential audience, easier updating of educational content, and lower development costs compared with other hi-tech delivery options (e.g. live interactive video) (Kerka, 1996).

With the increasing number of online courses and programs, the number of institutions, colleges, universities, and companies who provide them is also increasing. This causes competition among providers in the field of distance education (Tricker, Rangecroft, Long & Gilroy, 2001). In this new competition field, the focus has been shifted to learner's need, expectation and satisfaction. Especially, learner satisfaction is more important than ever in this new competitive field (Allen & Seaman, 2004). While promoting the quality of online programs in today's market, higher education institutions consider student satisfaction as one of the major principles (Moore, 2002; Moore & Kearsley, 2005). Feasley and Olgren (1998) mentioned that according to Kirkpatrick's (1998) four levels model of learning which consists of reaction, retention, application, and results, the learner's reaction to course material is categorized as

the first level, called reaction. In the reaction level, measuring learner satisfaction provides information about the attentiveness of the student, the overall learning experience, and the effort exerted to learn. High levels of learner satisfaction leads to lower attrition rates, an increase in enrollments, increased learner motivation, and a more productive learning environment (Ancis, & Brown, 2001; Biner, Dean, & Mellinger, 1994; Bolliger, 2004; Schwitzer).

Student satisfaction has been the proper attention in distance learning environment like traditional learning environment in the last years. It is seen as an important measure of the key variables in determining the success or failure of distance learners, courses, and programs (Debourgh, 1999). Therefore, there are number of published studies related to student satisfaction in the literature. This study will supplement this growing field of research by examining several factors that affect satisfaction of participants in an entire online certificate program.

1.1 Background of the Study

The development of information and telecommunications technology has led to an explosive growth in the Internet technologies, such as, World Wide Web (WWW), e-mail. Along with the astonishing growth of Internet usage, an increasing number of educational institutions started to adopt their courses into web-based education or online education. When this new form of distance education was first introduced, it was very popular in many countries such as United States, England, Canada, Portugal, South Africa, and Australia, where lots of students enrolled in some type of online education courses and programs (Simonson et al., 2000). For example, during the 2000-2001 academic year, it is estimated that 3,077,000 students were enrolled in distance education courses offered by 2-year and 4-year institutions (The NCES, 2003). Also, 56% of these institutions offered distance education courses and 12% of all institutions indicated that planned to start offering distance education course in the next three years in USA.

Looking at Turkey's condition, it is a developing country and as a developing country with a relatively young population, education has the greatest priority for Turkey. However, most of its young population can not get higher education since admission to higher education is very competitive and based on a nation-wide examination (Student Selection and Placement Exam) every year. In the last year over 1.5 million high school graduates took the test and less than a quarter of these students admitted to conventional higher education institutions. Distance education is a very rational alternative to increase an overall education level due to the characteristics of Turkish educational system and the need for efficient use of human resources (Ozkul, 2001). Even though a distance education model and correspondence course was firstly offered to increase national literacy in a meeting where national education problems were being discussed in 1927, the implementation of distance education started in 1982 in Turkey. Anadolu University began distance higher education in the preserve of its Open Educational Faculty (OEF), OEF started programs in Business Administration and Economics with a student enrollment of 29,479 for the 1982-1983 academic year in 1982 (Ozkul, 2001). Now, there are more than 500,000 students are enrolled at Anadolu University and it is one of the mega universities of the world.

Moreover, in 1990s, some courses were given on the Internet and the sources were shared by means of distance education at various universities other than OEF, such as METU and Bilkent. In 1996, Bilkent University initiated some synchronous distance education courses via satellite. Istanbul Technical University established remote classrooms via a microwave link connecting two campuses that were in different locations in Istanbul. Middle East Technical University (METU) has started an experimental distance education course via the Internet in 1997 (Yazici, Altas & Demiray, 2001). Following years, METU has been experiencing an Internet Based Distance Learning certificate programs (i.e. IDE_A which was investigated in this study and IDEAS), and Online M.S. degree program in Informatics (ION). A few numbers of lecturers at METU have started to support their courses for the students with web pages. Furthermore, Electronic Master of Business (e-mba) which started in November 2000 was a traditional

MBA program adapted to distance learning techniques and principles in Istanbul Bilgi University. One of the other distance education projects were started in July 2000 in Sakarya University and online learning was given to the about 2000 undergraduate university student in each 2001-2002 fall and spring semesters. In these days, two international distance education symposiums were held in 1996 and 1998 respectively (Yukselturk, 2005). Although these implementations will not increase as much as at the beginning years, this trend in institutions and organizations will continue all over the worlds because online courses or internet based courses bring many facilities to students and educational institutions.

The growth of distance education over the world has enhanced a great deal of research. Research involving distance education generally fall into three major categories: (a) a comparison of student outcomes in conventional and distance learning environments, (b) student attitudes toward distance learning, and (c) student satisfaction with the distance learning experience (Phipps & Merisotis, 1999). Even though the majority of studies in the literature are related to comparison of learning effectiveness between online and traditional learning, these comparison studies found that there seems to be no statistical difference in learning effectiveness between online and traditional learning (Russel, 1999). However, researchers agreed that online learners have different experiences from traditional learners (Moore & Kearsley, 2005). In other words, data available from several studies about online students showed that their characteristics, needs, expectations and satisfactions are different from on-campus students. In order to develop high quality distance education courses and programs, it is important for designers and educators of distance education courses to understand the characteristics of distance learners and what affects their success, and also satisfaction.

Satisfaction can be simply defined as assessing learners' reactions or attitudes towards a program (Feasley & Olgren, 1998), actually it is not just a simple concept (Sener & Humbert, 2002). As we know that learning outcomes can be measured in cognitive and affective domains. In the cognitive domain, learning

outcomes include student performance on exams measuring students' ability to remember and apply knowledge taught by instructors. In the affective domain, learning outcomes involve students' attitudes, appreciations, values and emotions. According to this perspective, satisfaction has been regarded as an important measure of learning in the affective domain. Also, satisfaction has been critical indicator of evaluation in learning environments and it can be used to determine the effectiveness and future improvement of programs (Kirkpatrick, 1998).

Student satisfaction is seen as a major component in ensuring learning outcome and determining the effectiveness of learning. Examining student satisfaction in courses or programs can lead to significant student achievements and program improvements. In addition to these, the previous studies emphasized several other reasons why analyzing learner satisfaction is important for educators and developers who deal with online courses and programs in the literature (i.e. Biner, Dean, & Mellinger, 1994; Feasley & Olgren, 1998; Schwitzer, Ancis, & Brown, 2001; Kelsey, Lindner & Dooley, 2002). According to these studies, the benefits identified on learner satisfaction could be grouped into three main items as follows:

- Lower student attrition. Students who are satisfied with their classes and programs tend to have lower attrition rates, show high levels of motivation and be committed to their educational goals.
- Greater commitment to a distance education program. Students who are satisfied are more likely to enroll in another online course. In other words, high learner satisfaction from previously enrolled students helps increase enrollments.
- A greater number of referrals from enrolled students. Students who are satisfied are more likely to recommend distance courses to family and fellows.

Student satisfaction in distance education is a complex concept and it depends on a number of factors (Sener & Humbert, 2002). Some of the major factors that might affect student satisfaction in the literature are shown in Table 1. For

example, motivation is a significant predictor in determining student satisfaction (Keller, 1999; Sankaran & Bui, 2001; Shih & Gamon, 2001; Song, 2000). Also, many authors (Debourgh, 1999; Eom, Ashill & Wen, 2006; Fulford & Zhang, 1993; Moore, 1989; Swam, 2001; Woods, 2002) reported that interaction with instructors and other students are significantly related to satisfaction. Support services are seen as another factor (Biner, Dean, & Mellinger, 1994; Schwitzer, Ancis & Brown, 2001; Tallman, 1994). The other factors in the literature are as follows: instructor and instruction issue, willingness to enroll in a DE course, convenience and flexibility, course management, interactivity, online readiness, and locus of control. In brief, these factors might affect student success and especially student satisfaction in many studies in the literature.

Table 1.1 Factors that might affect student satisfaction

Factors	Authors
Motivation	Keller, 1999; Sankaran & Bui, 2001; Shih & Gamon, 2001; Song, 2000
Interaction with instructors and other students	Eom, Ashill & Wen, 2006; Fulford & Zhang, 1993; Moore, 1989; Debourgh, 1999; Swam, 2001; Woods, 2002
Support services	Biner, Dean, & Mellinger, 1994; Schwitzer, Ancis & Brown, 2001; Tallman, 1994
Instructor and instruction issue	Finaly-Neumann, 1994;Biner, Dean, & Mellinger,1994; Bolliger, 2004
Willingness to enroll in a DE course	Pierre & Olsen, 1991; Tallman, 1994
Convenience and flexibility	Arbough, 2000
Course management	Biner, Dean, & Mellinger, 1994; Eom, Ashill & Wen, 2006
Interactivity	Bonk, 1998; Bolliger, 2004
Readiness for online learning	Eastmond, 1994; Gunawardena & Duphorne, 2001
Locus of control	Dille & Mezak, 1991; Parker, 1999
Online technologies self-efficacy	Lim 2001; Wang & Newlin, 2000

As a summary, student satisfaction is considered to be an important goal for many colleges and universities. There are several factors that affect satisfaction in learning environment. Many studies have focused on student satisfaction and its factors with specific distance courses. This study examined several factors that

affect satisfaction of participants in an entire online certificate program. This helps us avoid the pitfall of a one-shot measure of student satisfaction and provide a better understanding of changes in student satisfaction in a long period of time. Further, it will offer some insights that may be beneficial in deciding how to structure online program offerings.

1.2 Purpose of the Study

Many higher education institutions have made the decision to offer online courses, certificate programs and full degree programs in the last years. One of these programs is the online Information Technologies Certificate Program (ITCP). This program first became valid in Turkey in the Middle East Technical University (METU) with the enterprise of METU Computer Engineering Department, technical support of METU Computer Center and collaboration of METU Continuing Education Center in 1998. The aim of this program is to contribute to the training of experts in the field of computer technologies in Turkey. All institutions or programs, like online ITCP, try to provide quality online courses that offer a high level of participant success and satisfaction. In this study, the main aim was to investigate several factors that affect satisfaction of participants enrolled in this online certificate program.

There were three main purposes under the main aim. The first one was to describe the strength and direction of the relationship between online technologies self-efficacy, online learning readiness, locus of control, prior knowledge about program courses and participant satisfaction. The reason for looking at this purpose was to find measures that can predict the participant satisfaction. The second one was to investigate the participant satisfaction based on semester one, two, three and four in online ITCP respectively. The reason for looking at this purpose was to determine whether there were changes in participant satisfaction across the program. The last one was to investigate the factors that contribute participant satisfaction in this online certificate program. The reason for looking at this purpose was to analyze the factors that contribute participant satisfaction

deeply with gathering information from both participants and instructors of online ITCP in a qualitative way.

1.3 Significance of the Study

The information industries are a major source of jobs, economic growth and new business opportunities. Other industries across the economy are also being transformed as the information industries and new information and communications technologies help those industries to improve their competitiveness. As we move into the twenty-first century, our economic, political and social processes will become increasingly knowledge and information based. This will require increased emphasis on the skilled IT worker. One of the ways to educate many people who are mainly adults to cover the need for the skilled IT workers is preparing online programs about computer technology. In the literature, there are many studies only about web based courses given in universities or colleges for their students. With this study, the participants who attended online certificate program will be examined in respect to several ways as a specific type of online certificate programs' students in Turkey.

Within the past ten years, many institutions and universities have begun offering courses and degrees through the Internet and other distance education technologies. Therefore, there is a good deal of research dealing with distance education. However, Phipps and Merisotis (1999) said that a major shortcoming of the distance learning research to date was the emphasis on student outcomes for individual courses rather than for total academic programs. Sener and Humbert (2002) stated that more longitudinal studies are needed related to this topic. This study investigated participant satisfaction within an entire online certificate program. In addition, many study results were depended on only students' or only instructors' views and only one research method was used in the literature. In this study, subject was chosen from both students and instructors of the program and data was collected by both quantitative and qualitative ways to complement each other.

As online education continues to expand at an exponential rate, educators and policymakers alike find the need to gain a greater understanding of the student in online learning environment especially when considering the issue of quality in online education (Fresen, 2005; Meyer, 2002). If we want to develop distance education programs with high quality, it is necessary to investigate the characteristic of satisfied online learners (Meyer, 2002; Moore & Kearsley, 2005). Therefore, these programs will meet students' needs and promote their responsibility for learning. The results of these type studies help us to elicit the factors or variables that impact student satisfaction in online programs.

Furthermore, there is a need for researchers to examine the predictors of successful and satisfied students in web-based education courses since their drop out rates far exceed those students who enrolled in traditional on-campus courses (Moore & Kearsley, 2005). In this online certificate program, about 35 % of this program participant didn't complete program in the last three year and it is also high for this program (Yukselturk & Inan, 2006). With the help of this kind of studies, support systems and services for students could be designed or redesigned more effectively.

To sum up, this study analyzed factors that contribute to the promotion of lifelong learning by three ways. One way was investigating relationships among predictive variables (online technologies self-efficacy, online learning readiness, locus of control, and prior knowledge about program courses), and satisfaction of participants, another way was investigating participant's satisfactions with time interval in the semesters of program, and the last way was investigating the factors that contribute participant satisfaction in respect of the participants' and instructors' views in this online certificate program. This information could be used to assist designers and instructors in giving online course or institutions of higher education in planning for programs to give certificate or degree as well as increase the overall satisfaction of the adult learners in online learning environment.

1.4 Research Questions

The following research questions guided the current study:

1. What are the factors that contribute participant satisfaction in online Information Technologies Certificate Program (ITCP)?

1.1 What are the participant initial perceptions of online technologies self-efficacy, online learning readiness, locus of control, and prior knowledge about program courses in online Information Technologies Certificate Program (ITCP)?

1.2. What is the participant satisfaction in regard to learner-learner interaction, learner-instructor interaction, course structure, institutional support, and flexibility, based on semester one, two, three and four in online Information Technologies Certificate Program (ITCP)?

1.3. What is the nature of the relationship between participant initial perceptions of online technologies self-efficacy, online learning readiness, locus of control, prior knowledge about program courses and participant overall satisfaction in online Information Technologies Certificate Program (ITCP)?

1.4. Does the participant satisfaction change throughout online Information Technologies Certificate Program (ITCP) based on semester one, two, three, and four?

1.5. What are the participants' views about satisfaction in online Information Technologies Certificate Program (ITCP)?

1.6. What are the instructors' views about satisfaction in online Information Technologies Certificate Program (ITCP)?

1.5 Definition of Terms

Information Technology (IT): Information Technology is the study, design, development, implementation, support or management of computer-based information systems, particularly software applications and computer hardware (ITT Technical Institute, 2003).

Distance Education: "Distance education is planned learning that normally occurs in a different place from teaching and as a result requires special techniques of course design, special instructional techniques, and special methods of communication by electronic and other technology as well as special organizational and administrative arrangements." (Moore & Kearsley, 2005, p.2).

Synchronous communication: Synchronous communication is communication taking place in real time- like a face-to-face meeting, a telephone call, or a class held at a specific location with instructor and students meeting face-to-face. All participants in the interaction must be present, although not necessarily at the same physical location.

Asynchronous communication: Asynchronous communication is communication taking place at different times or over a certain period of time. It means that it is not real-time based communication. Teachers and/or learners are not tied to a common location or timeline.

Readiness for online learning: Warner et al.(1998) defined the notion of readiness for online learning in terms of three aspects: (a) students' preferences for that form of delivery as opposed to face-to-face classroom instruction, or the provision of print-based pre-packaged resource materials; (b) student confidence in using electronic communication for learning and, in particular, competence and confidence in the use of Internet and computer-mediated communication; and (c) ability to engage in autonomous learning.

Locus of control: It is a theoretical construct grounded in social learning theories and refers to people's belief about their control over life events (Rotter, 1966).

Self-efficacy: Beliefs about personnel competence in a particular situation (Bandura, 1997).

Participant satisfaction: Satisfaction is defined by learner reported feelings about interaction with instructor and peers, course structure, institutional support, and flexibility.

CHAPTER 2

REVIEW OF LITERATURE

The purpose of this chapter is to review the existing body of theory and research literature as it pertains to the primary elements of the study. To produce a theoretical base for this study, the literature was reviewed for the major concepts of distance education, online education, and student satisfaction. The first section provides an overview of the field of distance education, definition, history and theories associated with distance education. The second section provides the general characteristics of online education, asynchronous and synchronous education, and ideal online education environments. The final section explores the issues of student satisfaction and the factors affect student satisfaction in regard to online student characteristics and online learning environment characteristics.

2.1 Overview of Distance Education

Distance education will be analyzed briefly with discussing its definition, history and theories in the literature.

2.1.1 Definition of Distance Education

In the literature, distance education has been referred to a list of terms which are correspondence study, home study, independent study, off-campus study, external study, and open learning (Keegan, 1996). It is simply defined that a form of education where the learner is in some way separated from the instructor and instruction is delivered with print or electronic communications media to the

learners. Moore and Kearsley (1996) wrote the following definition of distance education that is often cited in the literature:

> Distance education is planned learning that normally occurs in a different place from teaching and as a result requires special techniques of course design, special instructional techniques, special methods of communication by electronic and other technology, as well as special organizational and administrative arrangements (p.2).

According to Moore and Kearsley (1996), a systems model for distance education has elements of resources, design, delivery, interaction, and learning environment. The institutional history and philosophy about distance learning are part of the systems model along with the attributes of teaching, learning, communication, design, and management. This model emphasizes how the attributes are interconnected. In other words, they stated distance education should be conceived and developed as a total system with interacting components. Their model has a series of inputs and outputs shown in Table 2.1.

Table 2.1 Distance Learning Systems Model

Inputs	**Outputs**
Student characteristics	Student satisfaction ratings
Instructor experience	Student achievement scores
Competence of administrative staff	Student completion rates
Efficiency of course development	Total enrollments
Student access to resources	Quality assessments
Response time	Cost and revenue
Local site coordination	Staff turnover
Institutional cooperation/support	
Reliability of evaluation	

Note: From Moore, M.G. and Kearsley, G. (1996). Distance Education: A Systems View. Belmont. CA: Wadswwoth Publishing Company. Page 15

2.1.2 History of Distance Education

Distance education, which has a long history, has continued to grow with each new technology that has been developed in the history. It included a wide variety of media from the printed word to computers.

The initial recorded examples of distance education were seen in late 1800s. Numerous schools of correspondence became widespread across Europe between 1840 and 1900. Parallel to Europe, first examples of distance education examples were seen in America in 1880s. The first degree correspondence programs began in 1874 at Illinois State University. Radio was first used for distance education in 1919, at the University of Wisconsin. Instructional television followed in the 1930s at the University of Iowa (Verduin & Clark, 1991).

The current rapid growth in distance education began in 1970 with the founding of the Open University of the United Kingdom. Very large Open University programs (from 100.000 to 1 million students each) now are founded in countries, such as China, India, Korea and South Africa (Keegan, 1996). During the 1980s and 1990s, advances in telecommunication technology have made possible distance education programs that use audio and video teleconferencing. Most recently, with the help of Internet technology, the barriers, distance and time are being broken down. That brings savings in terms of cost and time, opens the doors for globalization, competitive advantage, and provides growth, and new services. These developments have improved people's vocational and employment prospects and opportunities. There are some statistical results about how online course is increasing in the institutions. For example, during the 12-month 2000-2001 academic year, it is estimated that 3,077,000 students were enrolled in distance education courses offered by 2-year and 4-year institutions in USA (NCES, 2003).

It is seen that there are three generation of distance education, which were linked historically to the development of production in the literature. Moore and

Kearsley (1996) stated that the correspondence education was really the first generation of distance education: "The principal media of communication are printed materials, generally a study guide, with written essays or other assignments being sent by the mail" (p.19). The second generation came about the appearance of the first open universities: "While open universities relied heavily on correspondence instruction, they also used broadcast and recorded media, especially programs distributed by radio, television and audiotapes" (p.19-20). The third generation of distance education is defined by the use of networks, internet and multimedia.

As a summary, distance education is not a new phenomenon. With the development of the postal service in the 19th century, correspondence colleges provided distance education to the students across the country. This trend continued well to the 20th century with the advent of radio, television, and other media that allowed for learning at a distance. In the last decade, distance education has changed significantly with the use of computer-mediated learning, two-way interactive video, and a variety of other technologies.

2.1.3 Theories of Distance Education

Distance learning has been shaped by the theories of independence, industrialization, interaction, transactional distance, systems theory, and the equivalency theory in the literature. These major theories are analyzed respectively.

Theory of independence: Wedemeyer (1971) stated the foundation for the development of American theories of distance education by describing independence in term of learners being self-directed and free to control the pace, time and place of learning. His work looked at various media that could be for teaching off-campus students. In 1969, the British government established British Open University based on similar model. Wedemeyer noted four elements of every teaching-learning situation: a teacher, a learner or learners,

communications systems or mode, and something to be taught or learned. He proposed a reorganization of these elements that would accommodate physical space and allow greater learner freedom.

Theory of industrialization: Peters (1965) mentioned the term distance learning and developed the theory of industrialization of distance learning. This theory of distance education was based on industrial methods that should be applied to the design and delivery of instruction for distance learning to be successful. Peters's theory is based on the economic and industrial techniques of planning, division of labor, mass production, automation, standardization, and quality control. In this theory, the process of distance education should be made by taking into account the industrial structures and characteristics of distance education.

Theory of interaction and communication: Holmberg (1989) developed the interaction and communication theory. He stated that dialog or interaction between student and instructor are the critical defining aspects of distance learning. The core of the theory are emotional involvement, personal relationships, and empathy between students and instructors. As a summary, this theory describes the impact of the feelings of belonging and cooperation as well as the actual exchange of questions, answers, and arguments on the education process.

Theory of transactional distance: Moore (1994) developed a theory of transactional distance learning. It focuses on the dimensions of dialog and structure to describe the distance between students and instructors. In this theory, the transactional distance between students and instructors is pedagogical, not geographic, and should be dealt with by changing interaction methods. There are three key variables to consider regarding transactional distance: structure, dialogue, and learner autonomy. Structure is determined by the actual design of the course, the organization of the instruction, and the use of various media of communications. According to Moore and Kearsley (1996), "dialog is determined by the educational philosophy of the individual or group responsible for the

design of the course, by personalities of the teacher and the learner, by the subject matter of the course, and by environmental factors" (p.201). Finally, learner autonomy depends upon the individual learner's sense of personal responsibility and self-directedness. In this theory, an instructional situation is considered more distant if there are lesser amounts of dialogue among the participants and less structure. For less distant situations, the converse is true.

Systems theory of distance education: This theory is stated by Saba (1999) to describe the interrelationships of the variables that make up the distance learning environment. It builds on Moore's elements of structure and dialog from the theory of transactional distance. According to the theory, the distance learning system is made up of both the elements and the interrelationship among the elements. It explains how distance learning systems are non-linear in nature and the fact that the learning environment is dynamic and constantly changing.

Equivalency Theory: It was developed by Simonson, Schlosser, and Hanson (1999). The elements of this theory include the concept of equivalency, the learning experiences, the appropriate application, and the learning outcomes. Simonson's equivalency theory of distance education states that if distance learning experiences are equivalent to conventional learning, then learning outcomes will also be equivalent. The more equivalent the learning experiences of distant learners are to those of local learners, the more equivalent will be the outcomes of the educational experiences for all learners. This theory is based on the following definition of distance education as formal, institutionally-based educational activities where the learner and teacher are separated from one another, and where two-way interactive telecommunication systems are used to synchronously and asynchronously connect them for the sharing of video, voice, and data-based instruction (Simonson 1995).

2.2 Online Education

Online education, online learning, distributed learning, e-learning and web-based instruction are all synonymous terms used to describe learning that utilizes the Internet and World Wide Web (WWW). We have seen distance education from printed materials delivered by postal carriers to the new virtual environment of online education in the literature. The significant growth and development of computer network capabilities in the Internet technologies has created this new opportunities for more effective distance learning. In the 21st century, distance education with Internet technologies is predominantly being seen in its newest format as online education or web-based instruction. According to Khan (1997, p.6), "web-based instruction is a hypermedia instructional program which utilizes the attributes and resources of the World Wide Web to create meaningful learning environments where learning is fostered and supported."

With help of the emergence and ongoing development of new technologies, especially Internet technologies, the online learning is rapidly changing. The Internet is possibly the most transformative technology in history, reshaping business, media, entertainment, and society in surprising ways. Although it is very powerful, we are just now trying to transform it into our education. In the last few years, as the Internet became more widespread, interact-based distance learning courses became popular and many higher education institutions are adding distance learning courses to their course offerings for economic reasons (Phipps & Merisotis, 1999).

There are many other benefits that both students and institutions can take from online education. At most basic level, the boundaries of time and place that restricted people have been eliminate so that students and instructors can be brought together when they are geographically separated. In addition, according to Khan (1997), there are many components and features inherent to WBI, including: interactivity; multimedia capabilities; independence from device, distance, and design; global accessibility; online resources and support; learner control;

convenience; ease of use; cost-effectiveness; non-discriminatory application; and collaborative learning. Harasim (1990) identified the following benefits of using CMC in online education: increased interaction, better access to group knowledge and support, convenience of access to online resources, increased motivation through peer learning, user control over the learning interaction, and divergent thinking through idea-generating activities.

In addition to advantages of online education, there are some disadvantages of this type of education for both learners and institutions. Disadvantages for the learners are loss of direct interaction with the instructor and possible loss of motivation to complete the course or program (Belanger & Jordan, 2000). When students are not familiar with the technology used in the course, it can be difficult for them to catch up with the rest of the group (Vrasidas & McIsaac, 1999). It can also be difficult to enable effective group collaboration and discussion. In addition, the potential for disruptive technical problems is an important factor (Belanger & Jordan, 2000).

As a result, one can conclude that even if using Internet in education has some difficulties, Internet-based distance learning brings many advantages and facilities to the instructors and students.

2.2.1 Asynchronous and Synchronous Online Education

Simonson, Smaldino, Albright, and Zvacek (2000) mentioned about online education categories that take advantages of the networking capabilities available today. These are same time, same-place; different-time, same-place; same-time, different-place; and different time-different place. In other words, online education can be asynchronous, synchronous and both. Asynchronous online education include e-mail, bulletin boards, downloading, streaming audio and video, electronic lectures, and internet tutorials. Online education occurs in a synchronous form that includes real-time conferencing (video or audio), Internet relay chats, white boards, and file sharing. Also, online education may also be

made up of a combination of technologies allowing institutions to offer courses in either a synchronous (real-time) or an asynchronous (anytime) mode.

The asynchronous online environment gives students the option of completing all of their coursework at their own convenience. Students are able to access the website at anytime and participate in discussions, send e-mails, or complete exams. Therefore, asynchronous distance education was conducted over the World Wide Web using various software communications applications such as WebCT, Blackboad.

In an asynchronous educational there are no class sessions, even though there may be occasional, scheduled meetings for specific purposes. Students study independently, in virtual groups, or both electronically. Almeda (1998) stated that asynchronous education gives students more flexibility and accommodate student schedules more easily than traditional education. Also, asynchronous education reduces the physical demands and costs associated with classroom and lab use. The expense of an asynchronous education can be significantly less than other forms of distance education since there is no need for special equipment, support personnel, or travel costs (Rumble, 1997).

In addition, there may also be real-time (synchronous) component in many online courses such as, chat rooms, live lecture (video conferencing or audio conferencing), and file transfers. Synchronous format is generally more convenient for the students who are able to access the systems and participate in the synchronous components from their home or workplace. For example, if students have to go out of city, they can still participant in their class from any geographical location.

Bonk et all. (1998) have compared the results of synchronous and asynchronous computer conferencing on web-based conferencing in teacher education. Their studies showed that delayed and real-time case collaboration foster completely different social interaction and dialogue pattern. They stated that while delayed

conferencing led to greater depth of discussion and peer responsiveness than real-time conferencing, in both conference formats, a few off-task behaviors and interpersonal comments were indicators of increasing group inter-subjectivity and peer scaffolding.

As a summary, today's technologies include a variety of computer mediated communication (CMC) methods. CMC permits students to interact with their instructors as well as classmates. It provides a venue where a virtual classroom can be established for students to share, discuss, and debate course related topics with their peers and teachers.

2.2.2 Ideal Online Education Environment

Distance learning courses should be carefully planned to meet the needs of students. There are many principles and guidelines that are intended to serve for identifying and evaluating distance learning courses in the literature. For example, The Institute for Higher Education Policy (2000) identified 24 quality benchmark measures for Internet-based distance learning delivery. These 24 quality benchmark measures were identified in seven categories. For these final 24 benchmarks, two organizations (the National Education Association, the largest professional association of higher education faculty in the United States, and Blackboard, Inc., a widely used platform provider for on-line distance education) worked together to examine the benchmarks by studying active distance learning programs at several institutions and to attempt to validate published benchmarks, with specific attention to Internet-based distance education. This goal is to ascertain the degree to which the benchmarks are actually incorporated in the policies, procedures, and practices of colleges and universities that are distance education leaders. These benchmarks are as follows:

Institutional Support Benchmarks

- A documented technology plan that includes electronic security measures to ensure both quality standards and the integrity and validity of information.
- The reliability of the technology delivery system is as failsafe as possible.
- A centralized system provides support for building and maintaining the distance education infrastructure.

Course Development Benchmarks

- Guidelines regarding minimum standards are used for course development, design, and delivery, while learning outcomes - not the availability of existing technology - determine the technology being used to deliver course content.
- Instructional materials are reviewed periodically to ensure they meet program standards.
- Courses are designed to require students to engage themselves in analysis, synthesis, and evaluation as part of their course and program requirements.

Teaching/Learning Benchmarks

- Student interaction with faculty and other students is an essential characteristic and is facilitated through a variety of ways, including voice-mail and/or e-mail.
- Feedback to student assignments and questions is constructive and provided in a timely manner.
- Students are instructed in the proper methods of effective research, including assessment of the validity of resources.

Course Structure Benchmarks

- Before starting an online program, students are advised about the program to determine if they possess the self-motivation and commitment to learn at a distance and if they have access to the minimal technology required by the course design.

- Students are provided with supplemental course information that outlines course objectives, concepts, and ideas, and learning outcomes for each course are summarized in a clearly written, straightforward statement.
- Students have access to sufficient library resources that may include a "virtual library" accessible through the World Wide Web.
- Faculty and students agree upon expectations regarding times for student assignment completion and faculty response.

Student Support Benchmarks

- Students receive information about programs, including admission requirements, tuition and fees, books and supplies, technical and proctoring requirements, and student support services.
- Students are provided with hands-on training and information to aid them in securing material through electronic databases, inter-library loans, government archives, news services, and other sources.
- Throughout the duration of the course/program, students have access to technical assistance, including detailed instructions regarding the electronic media used, practice sessions prior to the beginning of the course, and convenient access to technical support staff.
- Questions directed to student service personnel are answered accurately and quickly, with a structured system in place to address student complaints.

Faculty Support Benchmarks

- Technical assistance in course development is available to faculty, who are encouraged to use it.
- Faculty members are assisted in the transition from classroom teaching to online instruction and are assessed during the process.
- Instructor training and assistance, including peer mentoring, continues through the progression of the online course.
- Faculty members are provided with written resources to deal with issues arising from student use of electronically-accessed data.

Evaluation and Assessment Benchmarks

- The program's educational effectiveness and teaching/learning process is assessed through an evaluation process that uses several methods and applies specific standards.
- Data on enrollment, costs, and successful/innovative uses of technology are used to evaluate program effectiveness.
- Intended learning outcomes are reviewed regularly to ensure clarity, utility, and appropriateness.

These seven benchmark categories were seen as factors that affect student satisfaction in the literature. Similarly, the factors (i.e. student characteristics, interaction, support, course structure, flexibility) were analyzed in determining student satisfaction in this study. Also, interviews with instructors and students mentioned many principles, like above benchmarks, for designing effective online environments.

2.3 Student Satisfaction

Student satisfaction is related to the student's perception pertaining to the experience and perceived value of the education received while attending an educational institution (Astin, 1993). It can be an important measure of the key variables in determining the success or failure of learners, courses, and programs (Debourgh, 1999). Therefore, there are many published research on distance education and student satisfaction at higher education institutions. The research tends to focus on students satisfaction as measured by internally produced end of semester surveys, grades given on tests and or other course assignments. Most of the research focuses on comparing distance education satisfaction with traditional course delivery satisfaction.

Research showed that student satisfaction of distance education is regarded as positive in the literature (i.e. Daugherty & Funke, 1998; Hill, Rezabek & Murry, 1998). A meta-analysis about studies of comparison between distance education

and traditional methods showed that students find distance education as satisfactory as traditional classroom (see Allen, Bourhis, Burrell, and Mabry, 2002). In other words, the majority of these studies have concluded that there is no significant difference in student performance when traditional and distance education courses are compared (Russell, 1999). In the recent years, the focus has shifted to a more learner-centered approach. Although there is continued interest in the technology or comparisons, the focus is not on which medium is best, but on what attributes of the technology can contribute to a positive, equivalent learning experience (Simonson et all. 2000).

In this part of the chapter, examples of the studies related to the analyzing student satisfaction are presented. Astin (1993) identified the following factors as most important determining student satisfaction in his study with undergraduate students: (a) contact time with faculty members and administrators, (b) availability of career advisors, (c) student social life on campus, and (d) overall relationships with faculty and administrators. Bean and Bradley (1986) concluded the best predictors of student satisfaction are: academic integration, institutional fit, quality and usefulness of education, social life, and difficulty of the program. In another study, students' perceptions of their learning environment, including instructor, course content, peer interaction, and learner responsibility, are critical factors in determining their level of satisfaction (Postema & Markham, 2001).

Long, Tricker, Rangecroft, and Gilroy (1999) measured student satisfaction of distance education in higher education by reviewing evaluation of student needs and learning techniques. They explored designing and developing a template for assessing student satisfaction in distance education. The research used both quantitative and qualitative methods and results of the research indicated that students should join a particular program because (a) they feel the content matches their professional and personal needs, (b) the opportunity for flexible study attracts them, (c) the quality of course materials are important, (d) student-to-instructor interaction should be of the highest quality, and (e) relevant assignments and high-quality feedback are of central importance.

Biner, Summers, Dean, Bink, Anderson, and Gender (1996) described a study of 699 undergraduate students enrolled in 33 real-time, interactive tele-courses that investigated satisfaction with various facets of tele-course, demographic characteristics of students, and their experience with pervious tele-courses. Gender differences and prior experience had the greatest effect on course satisfaction. Male students were more satisfied than female students with the various aspects of the courses. Age was unrelated to student satisfaction. Similarly, DeBourgh (1999) conducted a study to determine predictors of student satisfaction in a graduate nursing program taught via fully interactive, multipoint real-time video teleconferencing and the World Wide Web. However, age and previous experience with a course taught via technology was not strongly correlated with student satisfaction.

Also, Brouard (1996) conducted a study to identify the relationship between student characteristics, computer literacy, technology acceptance, and student satisfaction in distance education courses. Computer literacy was significantly related to greater overall student satisfaction. Further, Bower and Kamata (2000) described the educational experience of students and faculty enrolled in distance education courses. The study evaluated personal characteristics of students and factors influencing their satisfaction with online courses. Expected grade and access were the factors that most strongly influenced student satisfaction with their online educational experience.

As summary, satisfaction can be simply defined as assessing students' reactions or attitudes towards a program (Feasley & Olgren, 1998). As mentioned studies related to satisfaction, it depends on a number of factors in distance education (Moore & Kreasly, 1996). In this chapter, the factors were analyzed thoroughly under two main titles: characteristics of online learners and characteristics of online educational environments.

2.3.1 Characteristics of Online Learners Affecting Satisfaction

Numerous demographic and learner variables that affect satisfaction and success have been identified in the literature. Phipps and Merisotis (1999) mentioned student persistence, age, sex, marital status, confidence (self-efficacy), independence (autonomy), literacy level, and time management skills. Also, Moore and Kearsley (1996) pointed to educational background (level of subject previously studied as well as previous distance learning experience), personality characteristics, extracurricular concerns (e.g. family, work), academic concern, and intent to complete as indicative of likely distance learning success or failure. In this part of the study, the major and most identified variables that related to this study variable are analyzed separately.

Age and Gender

One of the learner characteristics is gender that has often been the focus of research in distance education. When reviewing gender related studies, the effects of this variable are inconclusive on student success in distance education. On the other hand, it is seen that there are some differences in using online learning between male and female students in the literature. Arbaugh (2000) mentioned that males see online learning as a medium to provide education to many people more quickly and at a less cost. Males communicate via this medium in a competitive manner and also they try to improve their own status in relation to their peers. However, females view internet-based communication as a medium to develop higher collaboration in online learning. They are more supportive of networks to increase learning and communication for the group. As a summary, some studies reported differences between genders (i.e. Barrett & Lally, 1999; Biner, et. al, 1996; Taplin & Jegede, 2001), while others did not (i.e. Dille & Mezack, 1991; Lim, 2001).

Age is seen as another student characteristic in research studies since distance education is viewed as very attractive to adults. The convenience, flexibility and

self-pacing of distance education courses or programs are especially beneficial to them. Distance education allows them to continue their education without having to disrupt their employment or family obligations (Moore & Kearsley, 1996). Dille and Mezack (1991) found that the average age of successful student in their study was 28 as opposed to an average age of 25 for non-successful students. On the other hand, Biner et al. (1996) indicated that the age of the learners was unrelated to satisfaction in their live interactive telecourses. According to these studies, there are conflicting findings in regard to relations between age and dependent variables, such as, success, satisfaction, in the literature.

Prior knowledge

Prior knowledge is defined as the knowledge, skills, or ability that students bring to the learning process (Jonassen & Grabowski, 1993). Prior knowledge is one of the strongest and most consistent predictors of learning. Research suggests an inverse relationship between level of prior knowledge and instructional support. As the level of prior knowledge raises, the need for instructional support decreases; on the contrary, as the level of prior knowledge decreases, the need for instructional support rises (Jonassen & Grabowski, 1993).

Moore and Kearsley (1996) emphasized the importance of educational background in predicting success factor in distance education. Wang and Newlin (2000) found that the educational backgrounds of online learners could provide early warning indicators for failure or success in online education courses. On the contrary, educational level or academic standing has not been shown much to predict student satisfaction and success in a distance education environment in the literature. For example, Lim (2001) reported that academic standing did not affect student perceptions of web-based instruction. Also, Miller and Pilcher (2000) stated that there is no significant difference in student achievement with regard to academic standing between on-campus and off-campus courses.

Self-efficacy

Self-efficacy concerns students' confidence in their abilities to complete tasks or reach goals. It has been shown to be good predictor of future performance and to apply across a variety of conditions (Bandura, 1986). Also, it influences an individual's performance, emotions, behavior, and degree of exertion and determination expended on an activity. Prior experience, vicarious learning, verbal persuasion, and affective states are all contributors to self-efficacy (Bandura, 1986). Many different measures of self-efficacy exist. There are measures of general academic self-efficacy, math self-efficacy, computer self-efficacy, self-regulated learning self-efficacy. In distance education, computer-mediated communication technologies, such as e-mail, bulletin boards, newsgroups, video conferencing, have become the primary modes of interaction, communication and exchange of information between students and instructors. Therefore, several studies have been conducted on the self-efficacy of students toward distance education or the technology used in online learning.

Wang and Newlin (2000) found that self-efficacy beliefs for understanding course content and possessing the technological skills required for successful completion of an online course were statistically significant. They concluded that students who were confident in their computer skills exhibited less computer-related anxiety and were more likely to continue in an online course than students exhibiting lower confidence about their computing skills. Lim (2001) has indicated that, self efficacy in computer knowledge was the only statistically significant variable that can help predict the achievement. Another study by Pajo and Wallace (2001) suggestted that technology barriers impact the success of distance education in enjoyment, perceived usefulness, and future intentions to adopt Web-based technology.

Compeau and Higgins (1995) found in their study that individuals with high self-efficacy beliefs used computers more, experienced less computer-related anxiety, and enjoyed using computers more than individuals with self-efficacy beliefs.

Satisfaction and anxiety levels were also recognized as significant contributors to successful computer use. The significance of self-efficacy's explanatory power toward computer use was demonstrated by Hill, Smith and Mann (1987), who observed that computer self-efficacy affected whether individuals used computers without regard for their feelings about the importance of doing so.

In a study designed to validate an online technologies self-efficacy scale, Miltiadou and Yu (2000) affirmed that a review of the literature uncovered no instruments specific to measuring online students' perceptions of self-efficacy in predicting academic achievement, and the absence of specific instruments in the context of the online environment, the researchers developed the Online Technologies Self-Efficacy Scale that measured students' self-efficacy beliefs about communication technologies such as e-mail, Internet and computer conferencing. It was also used in this study.

Locus of control

Rotter (1966) proposed the locus of control construct and defined it as a person's belief in the amount of control a person has on specific events in life. Two types of locus of control have been defined:

- Internal locus of control refers to a belief that one's behavior can control specific events or outcomes,
- External locus of control refers to a belief that events or outcomes are controlled by forces external to oneself (e.g. luck, chance, powerful others).

Several decades of research have demonstrated that student perceptions about the amount of control they have over academic success and failures can contribute significantly to school performance (Bandura, 1986). Research generally showed that students with an internal locus of control were more likely to be successful or satisfied than students with an external locus of control in the distance education environment (Parker, 1999; Stone, 1992; Dille & Mezak, 1991).

Online Readiness

Online learning might not be for everyone, therefore students need to consider the differences between face-to-face and distance learning. A careful assessment of study habits and preferences is the key to a successful online learning experience. Also, research indicated that satisfaction may be related to the readiness of the participant to engage in online studies. Eastmond (1994) observed readiness related to the various personal factors a distance student brings to the learning equation which influence its success. These included learning preferences, style, and array of learning strategies, prior learning experiences, computer skills, and interest in the course content.

Gunawardena and Duphorne (2001) stated that "participants who felt more positively about their readiness to participate in an academic computer conference were more satisfied with the conference." (p. 15). They further asserted:

> This shows the importance of paying attention to learner readiness factors. . . .Paying close attention to the attitudes and skills [adult learners] bring with them, and orienting them to the skills they need to function effectively in an online environment, will help ensure a more satisfying learning experience (p. 15).

In their study, Gunawardena and Duphorne (2001) focused on seven readiness factors: (a) prior e-mail experience, (b) prior listserv experience, (c) prior comfort with CMC, (d) adequate technical training at the site, (e) self-efficacy in mastering the CMC system, (f) belief in CMC's potential for distance education, and (g) belief in the medium's capacity for academic discussions. As a summary, studies have attempted to identify various characteristics that prepare a student to participate in an online class and assure a successful outcome in the form of either student satisfaction or course completion.

Self-Regulated Learning Components

Research on self-regulated learning has increased exponentially in recent years. It is important for all students as well as educators since the primary goal of education, especially distance education, is to develop independent and self-regulated thinkers and learners. Schunk and Zimmerman (1998) stated that self-regulated learning refers to the process whereby learners systematically direct their thoughts, feelings, and actions toward the attainment of their goals. According to the work of Pintrich and DeGroot (1990), self-regulated learning conjoins three major constructs: (a) students' metacognitive strategies for planning, monitoring, and regulating their cognition, (b) students' management and control of their effort on classroom academic tasks, (c) cognitive strategies that students use to learn, remember, and understand the material.

Research conducted on self-regulated learning showed the strong relationship between students' academic success and satisfaction and the use of self-regulated learning strategies (Schunk & Zimmerman, 1998; Zimmerman, 2002; Zimmerman & Martinez-Pons, 1990). Similarly, the relationship between self-regulated learning strategies and success is also stated widely in the distance education literature (i.e. Azevedo et al., 2004; Whipp & Chiarelli, 2004).

In addition to self-regulated learning, being a self-regulated learner is another important issue. Zimmerman (1986) explains that self-regulated learners are students who are "...metacognitively, motivationally, and behaviorally active participants in their own learning process." And also he states that "self-regulated learners perceive themselves as competent, self-efficacious, and autonomous" and "self-regulated learners select, structure, and create environments that optimize learning." (p. 309).

Adult Learning Theory: Andragogy

The term androgogy has been used in the field of adult education to describe a variety of lifelong learning activities that engage adults throughout their lives Knowles (1984, p.125) mentioned about adult learning theory "adult learners take control of their education, and want the opportunity to learn at their own pace, at times and places compatible with the commitments of family, work and leisure. Also, they demand relevant and applicable coursework and a learning environment that is supportive and collaborative." Knowles, Holton and Swanson (1998) discuss six assumptions of andragogy. Following are expanded definitions of those assumptions with their implications for technology-based instruction:

- The Learner's Need to Know: Adults need to know why they should learn something.
- The Learner's Self-concept: Knowles, Holton, and Swanson emphasize that "adults resent and resist situations in which they feel others are imposing their wills on them." (1998, 65).
- The Role of the Learner's Experience: Adults have had a lifetime of experiences. They want to use what they know and want to be acknowledged for having that knowledge.
- A Student's Readiness to Learn: Adults become ready to learn something.
- The Student's Orientation to Learning: Adults are life, task or problem-centered in their orientation to learning.
- Students' Motivation to Learn: While adult learners may respond to external motivators, internal priorities are more important. Incentives such as increased job satisfaction, self-esteem and quality of life are important in giving adults a reason to learn.

2.3.2 Characteristics of Online Educational Environments Affecting Satisfaction

In addition to demographic and learner variables, there are various factors related to the characteristics of online educational environments affecting student satisfaction. Interaction, course structure, support services, flexibility are some of the major factors related to this study variables.

Interaction

Shale and Garrison (1990) suggested that the most significant attribute for characterizing distance education is how communication between instructor and student is carried out. It means interaction. Moore (1989) identified three types of interaction that were essential in distance education: (1) learner-instructor interaction, which inspires motivation and provides feedback and dialog between student and instructor; (2) learner-content interaction, which enables students to obtain information from the material; and (3) learner-learner interaction, which facilitates the exchange of information, ideas and dialog among peers who are engaged in a common intellectual pursuit. Also, interaction is an important part of learner satisfaction. Research suggested that both quality and quantity of interaction with the instructor and peers are much more crucial to the success of online courses and student satisfaction than to success and satisfaction in traditional courses (Woods, 2002). In a study by Fulford and Zhang (1993), the students' perception of interaction was the critical predictor of satisfaction in a distance-learning course.

In another study conducted to determine predictors of student satisfaction with a fully interactive, multi-point real-time video teleconferencing and web-based course, Debourgh (1999) found that factors that were related to interaction were critical important. These factors are related to promptness of answers to student questions, instructor encouragement of participation, accessibility of instructor, and promptness of instructor feedback on student work. Furthermore, Swam (2001) analyzed satisfaction of university level online students (1406 students

from 73 online courses) and stated that three factors contributed significantly to the success and satisfaction level of online courses. These factors are contact with and feedback from the instructors, active discussion among students, and clarity in course design. This result is consisted with Moore's (1989) promotion of three types of interaction in distance education: learner-instructor, learner-learner, learner-content.

Course structure

The rapid development of the World Wide Web has provided an inexpensive and valuable ways to deliver content that goes beyond text. By placing course content within HTML web pages, learners interact with the graphic display of course material as well. Successful distance learning environments provide learners an interaction with course content. This interaction permits learners to increase their understanding and obtain information from the learning materials.

Course structure is another important factor that affects the learner satisfaction in the literature. Course structure helps distance learners to plan, organize and manage their learning activities. In a study by Johnson (1993), dissatisfaction with the distance course is related to the lack of quality of the taped lectures and examinations, and discontent with the text and study guide. According to Hara and Kling (1999), dissatisfaction with the distance course is related to the lack of prompt feedback, technical difficulties, and ambiguous course instructions.

As a summary, course structure is seen as a crucial variable that affects the success of distance education along interaction. According to Moore (1991), the course structure "expresses the rigidity or flexibility of the program's educational objectives, teaching strategies, and evaluation methods" and the course structure describes "the extent to which an education program can accommodate or be responsive to each learner's individual needs" (p. 3).

Support services

The dominant feature of distance education is the physical and often temporal distance which separates the teacher and learner. Because distance students are often placed in a situation in which neither teachers nor fellow students are physically present to clarify, discuss, or provide feedback, effective distance education requires learner support system (Dillon & Gunawardena, 1992).

High quality of instructional and institutional support services also result in higher student satisfaction with the educational environment. Schwitzer, Ancis and Brown (2001) stated that interactive and engaging student services are a critical factor for student satisfaction. Moore and Kearsley (1996) suggested that students should have one contact person who will be able to assist them in distance education environment. Also, student's satisfaction might increase when on-site staffs are careful to their progress and problems (Biner, Dean, & Mellinger, 1994).

Flexibility

The learners are mainly adult with social, occupational and family commitments in distance education (Moore & Kreasly, 1996). Therefore, distance learners want to participate in the courses or programs whenever and wherever they need or want. In other words, the convenience and flexibility of distance program is another contributor to student satisfaction (Arbough, 2000). Maki, Maki, Patterson and Whittaker (2000) also found that students enjoyed the flexibility of online learning environment and they perceived the convenience of the online course as a major benefit. Increasing leaner control by providing flexibility and different choices within the instructional programs help strengthen learner satisfaction.

2.4 Summary

This chapter sought to provide a review of the literature related to the research problem of this study. At the beginning of the chapter, overview of distance education included definition, history and theories were presented. Then, online education and synchronous and asynchronous online environment and their advantages and disadvantages were discussed. Benchmarks were listed for ideal online learning environments. At the last part, relevant research related to the factors that affect student satisfaction was summarized. This research indicated that there were number of factors (i.e. learner characteristics and learning environment characteristics) that were all influential on student satisfaction in a distance-learning environment. The major studies related to the factors affecting student satisfaction in the literature were stated in a detailed way.

CHAPTER 3

METHOD

This chapter describes the methodology that was used to conduct the study. It is divided into following subsections: (3.1) research problem and research questions; (3.2) overall design of the study; (3.3) context and subject; (3.4) instrumentation; (3.5) data collection procedure; (3.7) data analysis; and (3.8) assumptions and limitations of the study.

3.1 Research Problem and Research Questions

This study was designed to investigate the factors that contribute satisfaction of participants enrolled in the online certificate program. The purposes of the study were: (1) to describe the strength and direction of the relationship between online technologies self-efficacy, online learning readiness, locus of control, prior knowledge about program courses, and participant satisfaction, (2) to investigate the participant satisfaction in regard to learner-learner interaction, learner-instructor interaction, course structure, institutional support, and flexibility based on semester one, two, three and four in online ITCP, and (3) to investigate instructors' and participants' views about satisfaction in online Information Technologies Certificate Program (ITCP). In accordance with these research purposes, the following research questions guided the current study:

1. What are the factors that contribute participant satisfaction in the online Information Technologies Certificate Program (ITCP)?

    1.1 What are the participants' initial perceptions of online technologies self-efficacy, online learning readiness, locus of control, and prior

knowledge about program courses in online Information Technologies Certificate Program (ITCP)?

1.2. What is the participant satisfaction in regard to learner-learner interaction, learner-instructor interaction, course structure, institutional support, and flexibility, based on semester one, two, three and four in the online Information Technologies Certificate Program (ITCP)?

1.3. What is the nature of the relationship between participants' initial perceptions of online technologies self-efficacy, online learning readiness, locus of control, prior knowledge about program courses and participant overall satisfaction in the online Information Technologies Certificate Program (ITCP)?

1.4. Does the participant satisfaction change throughout the online Information Technologies Certificate Program (ITCP) based on semester one, two, three, and four?

1.5. What are the participants' views about satisfaction in online Information Technologies Certificate Program (ITCP)?

1.6. What are the instructors' views about satisfaction in online Information Technologies Certificate Program (ITCP)?

3.2 Overall Design of the Study

The study was built on a mixed methods case study based on non-experimental design. When properly applied, non-experimental designs can offer useful and valid knowledge. Studies of this kind are considered easier, less costly and are the most widespread research plan used (Kerlinger, 1986). In a non-experimental design, no treatments are given. Due to no treatments, a non-experimental design cannot predict causal relationships. Instead, such design studies naturally

occurring variation in the independent and dependent variables without any interventions to equate cases prior to their exposure to the independent variable (Fraenkel & Wallen, 2000).

This non-experimental study was also a case study which is an in-depth study of a chosen event, activity, process of group using extensive data collection (Merriam, 1988). A case study approach is advantageous when "why" and "how" questions are being asked and it is recommended when the investigator believed that the contextual conditions are highly relevant to the phenomenon under study (Yin, 1994). It means that case study method is useful to understand particular situation, course, and program in depth, such as online certificate program in this study.

A combination of quantitative and qualitative research methods were used in this case study. With the development and legitimacy of both qualitative and quantitative research, the combination of both types of research is expanding (Tashakkori & Teddlle 2003). In other words, the mixed methods approach is useful to capture the best of both quantitative and qualitative approaches. Qualitative and quantative approaches should be mixed in a way that has complementary strengths and nonoverlapping weakness (Creswell & Plano-Clark, 2007). There appear to be three areas in which mixed method are superior to single approach designs:

- Mixed methods research can answer research questions that the other methodologies cannot.
- Mixed methods research provides better (stronger) inferences.
- Mixed methods research provides the opportunity for presenting a greater diversity of divergent views

According to Creswell and Clark (2007), this study was QUAN + QUAL. It means that both the quantitative and qualitative methods were used at the same time during the research, and both have equal emphasis in the study. The most common and well-known approach to mixing methods is the triangulation design. Creswell and Clark (2007) stated that the triangulation design is used when a

researcher wants to validate or expand quantitative results with qualitative data. This study was designed based on convergence model of triangulation desing in which the researcher collects and analyzes quantitative and qualitative data separately on the same phenomenon and then the different results are converged during the interpretation (Creswell & Clark, 2007).

The quantitative part of this study was a correlational study to reach the first and second purposes of this study. Fraenkel and Wallen (2000) stated that correlational research designs are used for two major purposes: to help explain important human behaviors or to explore relationships between variables and to predict likely outcomes or to predict score on one variable if a score on the other variable is known. There are some advantages in using correlational research designs especially where experimental studies are difficult to design. For example, they help us analyze the relationships among a number of variables in a study and they permit analysis of how these multiple variables interact to affect the behavior under study. Also, correlational research designs provide information about the degree of the relationships among the variables.

Furthermore, considering the last purpose of the study, the qualitative paradigm is the appropriate choice. Qualitative study is an inquiry of understanding social or human problems based on building a complex holistic picture formed with words, reporting detailed views of informants, and conducting the research in natural setting (Creswell, 1994). Also, Phipps and Merisotis (1999) pointed out the problems with most distance learning research and the opportunity for further research to validate the different technologies used for distance learning. They asserted that one of the past studies were that the relationships to test quantitative procedures need to be identified through qualitative methods. In addition to quantitative methods, semi-structured interviews were conducted to gather relevant data in this study. One of the most common methods used by qualitative researchers is the interviewing of the selected individuals. An interview is a purposeful conversation, usually between two people but sometimes involving more that is directed by one in order to get information from the other (Morgan,

1998). Additionally, participants' online discussion logs were examined to find out the level of participation to the online communication in the program.

3.3 Context and Subject

3.3.1 Online Information Technologies Certificate Program (ITCP)

Participants of the study were selected from the online Information Technologies Certificate Program (ITCP), which is one of the first Internet Based Education Project of Middle East Technical University. It is based on synchronous and asynchronous education over the Internet offered by Computer Engineering Department with Turkish course materials prepared by the instructors who give the courses from the same department. The main aim of the online ITCP is to train the participants in IT field to meet demand in the field of computer technologies in Turkey. Furthermore, the online ITCP provides opportunities for the people who cannot get education in information technologies or computer engineering, but who are interested in this area, who would like improve themselves in this area and desire to make progress in their existing career.

Internet Based Education Project is the project of a series of Internet-based programs at METU. One of these programs is the online Information Technologies Certificate Program, which is still active now. At the beginning, it has started with the organization of IBM which sponsored the program, METU Continuing Education Center, and Department of Computer Engineering. However, with the following years, it has been conducted in the management responsibility of Continuing Education Center, academic responsibility of the Department of Computer Engineering, and technical support of METU Computer Center.

This program enables participants to take the lectures whenever they want, wherever they want; with the chance of arranging their study time, reviewing as much as they like and discussing the necessary points.

Approximately 60-80 participants registered to the online ITCPs in each year. Any participants who graduated at least from high school could apply to this program, but after third program, participants who are students or who graduated from 2 or 4 year university programs have been accepted to the programs. Other expected characteristics of participants to be enrolled in the program are as follows;

- being computer literate
- accessing a computer which has Internet connection and multimedia properties
- intermediate level of English (being able to understand what he/she reads)
- attending face to face courses and examinations, which will be held at METU campus for two days in each eight-week semester
- sparing at least 6 hours for each course in a week

In addition, there have been changes in online ITCPs since the first program. This program started with fifteen months for the first group, decreased to twelve months for the second group and nine months for the third, fourth and fifth groups. It is composed of eight courses and a Software Development Project given in the first and second groups. At the beginning, the names of the courses and the terms they were given are as follows: Computers Systems and Structures, Computer Programming with Java I, Computer Programming with Java II, Operating Systems with UNIX, Data Structures and Algorithms with C++, Software Engineering, Database Management Systems, Computer Networks, and Software Development Project. After the third program, number of courses given in online ITCPs decreased to eight courses and some of the courses were replaced by different courses. For example, Computer Programming with Java I course was replaced by Introduction to Computer Programming with C course and Data Structures and Algorithms with C++ course was replaced by Data Structures and

Algorithms with C course in the fourth and fifth programs. Furthermore, Computer Programming with Java I and II courses were combined and given as an elective course in the fourth and fifth programs.

This program does not only aim to supply lecture notes on the Internet like their primitive examples but also provides participants a pleasant way of learning with activities other than reading from computer with related visual and auditory elements and interactive communication channels. In addition to the interactive course material, each course has an e-mail address, discussion list and chat sessions to provide interaction between instructors and participants, and participants and participants. At the beginning of the programs, a CD that includes necessary programs, compliers, editors for the courses are posted to the participants.

Furthermore, each course, except Software Development Project course, has one text book that provides more detailed information. Reading assignments are given from these text books. Also, for each lesson, at least three assignments were assigned to the participants during the terms. At the end of each term, there are face-to-face lectures for each course and traditional final examinations of the courses within the campus of Middle East Technical University. The participants' final grades were based on mainly final examinations, assignments, attendance to the chat sessions and participation in the discussion lists. In addition, in the last term, the groups of the participants or individuals in the Software Development Project course prepare software projects which are mainly used in real life with guidance of the instructors. They are presented to all participants at the end of the programs.

In conclusion, this official certificate is approved by the president of the METU, the chairperson of the Computer Engineering Department and the president of the Continuing Education Center.

3.3.2. Subject of the Study

The subjects of this study were the participants who enrolled and instructors who offered courses in the online Information Technologies Certificate Program in 2004-2005. The number of participants who registered in the online ITCP was 62 and the number of instructors who gave course online in the online ITCP was 8.

Table 3.1 presents the demographic characteristics of the participants. The number of male participants was greater than the number of female participants, and the participants' age ranged from 20 to 40 and above. The majority of the participants' age range was 19-24. In addition, the majority of the participants attended the online ITCP from Ankara and Istanbul, and they were university graduates and undergraduate students.

Table 3.1 Demographic characteristics of the online ITCP participants

	Online ITCP participants	
	N	**%**
Sex		
Female	15	24
Male	47	76
Age		
19-24	23	38
25-29	17	28
30-34	10	16
35-39	4	7
40 and above	7	11
Cities the participants from		
Ankara	30	48
Istanbul	11	18
Eskisehir	5	8
Others	16	26
Education Levels		
University graduates	30	48
Undergraduate students	26	42
Graduate students	6	10

N: Number of participants, %: Percentage of participants

In this study, the questionnaires at the beginning of the program were filled by all participants. However, the questionnaire (Online Student Satisfaction Questionnaire) was filled by thirty participants who attended all semesters, finished the program, and got ITCP certificate at the end of the program. Also, the researcher conducted interviews with three participants for each semester and totally 12 participants to analyze the factors that contribute their satisfaction deeply until the end of the program. During the face to face sessions at the campus of university, interviews were conducted with three participants who were selected purposively at the end of each semester. One was chosen from active participants who did their assignments, attended chat sessions, discussion lists, etc. One was chosen from participants who did little assignments, attended chat sessions sometimes (one or two times), discussion lists, etc. but attended face to face courses and exams. One was chosen from drop out participants who did not complete the programs. These three types of participants were selected to represent all subject of the study. Purposeful sampling is the dominant strategy in qualitative research. Purposeful sampling seeks information-rich cases which can be studied in depth (Patton, 1990). Also, Fraenkel and Wallen (2000) stated that purposive sampling is different from convenience sampling in that researchers do not simply study whoever is available, but use their judgment to select a sample that they believe, based on prior information, will provide the data they need.

Furthermore, there were eight instructors who gave one of the courses in the program. Each course instructor was interviewed individually about the factors that affect or contribute participant satisfaction in the program. Each instructor in this program was a faculty member in the Department of Computer Engineering of the Middle East Technical University, Ankara. They developed their course materials for this program. All of them have had experiences about giving their online course in this program for over six years.

3.4 Instrumentation

This section provides detailed information about the instruments used for data collection. In this case study, data was gathered through five online questionnaires and interviews with course instructors and selected participants in the online certificate program.

3.4.1 Online Questionnaires

Five online questionnaires were used to collect relevant data from participants about their perceptions of this online program. These were Online Technologies Self-Efficacy Scale measured participants' self-efficacy beliefs specific to the online environment, Readiness for Online Learning Questionnaire assessed participants' readiness for distance learning, Locus of Control Scale measured participants' locus of control orientation, Prior Knowledge Questionnaire assessed participants' prior knowledge about the program courses, and Student Satisfaction Questionnaire measured participants' satisfaction in this online Information Technologies Certificate Program (ITCP).

Pilot Study: Two of the five questionnaires (Online Technologies Self-efficacy Scale and Readiness for Online Learning Questionnaire) were originally developed in English, translation of items necessitated to suit the subjects in the present study. Researcher and bilingual Turkish educator translated each item into Turkish. Two experts who are instructors at Computer Education and Instructional Technology Department at Middle East Technical University examined the instruments. Since the subjects comprised of Turkish students, few items were adjusted by minor changes to ensure the applicability to all students. After that, the pilot study was conducted to test the reliability of Turkish version of these instruments. The adapted versions of the instruments were administered to first and second year undergraduate students at Computer Education and Instructional Technology Department in four different universities because these students were familiar with Internet technologies in this department, like participants in this

study. 258 students filled out the questionnaires at the beginning of fall semesters 2004-2005. 86 of students were from Middle East Technical University (METU). 80 students were from Hacettepe University. 48 students were from Ondokuz Mayis University, 41 students were from Kocaeli University. Before the administration, researcher at METU and Hacettepe University and instructors at Ondokuz Mayis and Kocaeli University gave students instructions for completing the questionnaires. The results were analyzed in SPSS 11 and the reliability of the questionnaires was satisfactory, with a Cronbach alpha of 0.97 in Online Technologies Self-efficacy Questionnaire and 0.76 in Readiness for Online Learning Questionnaire.

Online Technologies Self-Efficacy Scale (OTSE): The Online Technologies Self-Efficacy Scale (OTSE) is 29-item Likert type scale with five subscales: (1) Internet competencies; (2) synchronous interactions; (3) asynchronous interactions involving electronic mail; (4) asynchronous interactions involving electronic bulletin boards; and (5) web development (Miltiadou & Yu, 2000). For each item, participants were asked to indicate their level of confidence from "Very confident", "Somewhat confident", "Not very confident" to "Not confident at all". Each statement was preceded by the phrase "I feel confident". The original internal consistency reliability (Cronbach's coefficient alpha) estimate of 0.95 was obtained for the original 29-item instrument. Before using this scale in this study, a pilot study mentioned above was conducted to translate each item into Turkish and the reliability of the questionnaires were founded as satisfactory with a Cronbach alpha of 0.97 (see Appendix A).

Readiness for Online Learning Questionnaire (ROLQ): McVay (2000, 2001) has developed ROLQ which focuses on student behaviour and attitudes as predictors of online learning readiness. The questionnaire comprises of 13 items, rated by respondents on a 4-point Likert type scale. Also, the questionnaire was tested by other researchers in several studies. For example, Smith, Murphy and Mahoney (2003) stated that the reliability of this orginal questionnaire is satisfactory, with a Cronbach alpha of 0.83 and items in the questionnaire load mainly two factors

comfort with e-learning and self-management of learning. Before using this scale in this study, a pilot study mentioned above again was conducted to translate each item into Turkish and the reliability of the questionnaires were founded as satisfactory with a Cronbach alpha of 0.76 (see Appendix A).

Locus of Control Scale: The Internal-External Locus of Control Scale was used to measure students' locus of control orientation. It was originally developed by Rotter (1966). It is a 29 item forced-choice self-report scale with scoring range 0 (internality) to 29 (externality) excluding 6 buffer items. This scale was translated into Turkish and standardized on a Turkish sample by Dag (1991) (n=532). He found the Cronbach alpha coefficient as 0.71 and test-retest reliability as 0.83.

Prior Knowledge Questionnaire: Eight items were prepared by the researcher with help of experts to evaluate participants' prior knowledge about certificate program courses. Each item was related to each aim of courses which are given in the program. Each instructor approved the items about his/her course aims. For each item, participants were asked to indicate their level of knowledge with four scales from "I don't know," to "I know very well" (see Appendix A).

Student Satisfaction Questionnaire: The questionnaire was developed by Parlak (2004) based on four questionnaires in the literature (Instructor and Course Evaluation System, ICES, (University of New Mexico, 2001), Distance and Open Learning Environment Scale, DOLES, (Jegede, Fraser and Curtin, 1995), Class Interaction, Structure and Support, CISS, (Johnson, Aragon, Shaik and Rivas, 2000), and Web-Based Learning Environment Inventory, WEBLEI, (Chang, 1996)). It consisted of five main subscales:

- Learner-learner interaction (with 3 questions, the cronbach alpha value is 0.80),
- Learner-instructor interaction (with 12 questions, the cronbach alpha value is 0.93),
- Course structure (with 12 questions, the cronbach alpha value is 0.92),
- Institutional support (with 12 questions, the cronbach alpha value is 0.88),

- Flexibility (with 3 questions, the cronbach alpha value is 0.59).

This questionnaire was administrated to 202 students who are registered Anadolu University Open Education Faculty Administration of Information Program (21 students), Sakarya University Adapazari Trade School Administration of Information (33 students), Business Enterprise (34 students), Technology of Computer and Program (86 students), Mekatronik (16 students) and Electronic of Industry (12 students) programs. As a summary, it consisted of 38 five-point likert type items, and the overall Cronbach Alpha value of the questionnaire was 0.95 (Parlak, 2004).

3.4.2 Interviews

The quantitative methods were used mainly as the basis of this case study. In addition to these quantitative methods, complementary methods were still required to investigate the perception of the subjects in the online program. Therefore, semi-structured interviews were conducted to elicit additional information regarding instructors' and participants' views about satisfaction in this study. Interviews helped researchers gather descriptive data in the subjects' own words and give ideas to researchers about how subjects interpret the things (Bogdan & Biklen, 1998). As Bogdan and Biklen (1998) stated, "With semi-structured interviews you are confident of getting comparable data across subjects" (p.95).

In the present study, the researcher conducted semi-structured interviews with 12 participants chosen purposively and 8 course instructors who offered to 8 courses in this online program. Interview questions were developed around the central themes related to the components of the satisfaction (interaction with instructors and peers, course structure, institutional support, and flexibility) investigated in this study. The interview questions were examined by three experts in the field of instructional technology at the university for clarity. Before implementation, pilot studies were conducted with 4 participants and 2 instructors in previous online

ITCP program. With the help of these pilot studies, the interview schedules were improved and researcher had experience. The last versions of schedules consisted of about 16 major questions for the interviews with participants and 12 major questions for the interviews with instructors and were seen in Appendix B and C respectively. These schedules provided to the researcher several advantages during the interviews. For examples, they ensured good use of limited interview time; they made interviewing multiple subjects in a more systematic and comprehensive manner; and they helped keep interactions focused.

All interviews were conducted in a friendly climate. It helped that the participants and instructors were more relaxed and more open to state their views since participants were more familiar with the researcher in the each following semester and also researcher has worked with the instructors for a long time in this program. Therefore, researcher gathered rich information from participants and especially instructors during the interviews. Similarly, Bogdan and Biklen (1998, p.95) expressed that "Good interviews produce rich data filled with words that reveal the respondents' perspective." As a summary, both qualitative and quantitative results provided triangulation support of the reliability and validity of the study.

3.5 Data Collection Procedure

The data were collected from the beginning to the end of the online certificate program for this study. It took about nine months from October 2004 to July 2005. At the beginning of the program, face to face orientation was organized to explain the program and courses to the participants, help them meet each other and with the instructors, explain how to use the web pages, and also mention about questionnaires about this study, etc.

Quantitative and qualitative data were collected and analyzed concurrently as seen in Figure 3.1. After orientation and meeting activity day, web-based online questionnaires that included online technologies self-efficacy, online learning

readiness, locus of control and prior knowledge questionaires were administered during the first week of program. As participants submitted their responses to these web-based questionnaires, their data saved on a server. In additions, demographic characteristics of the participants were obtained from the application forms they filled out while registrations.

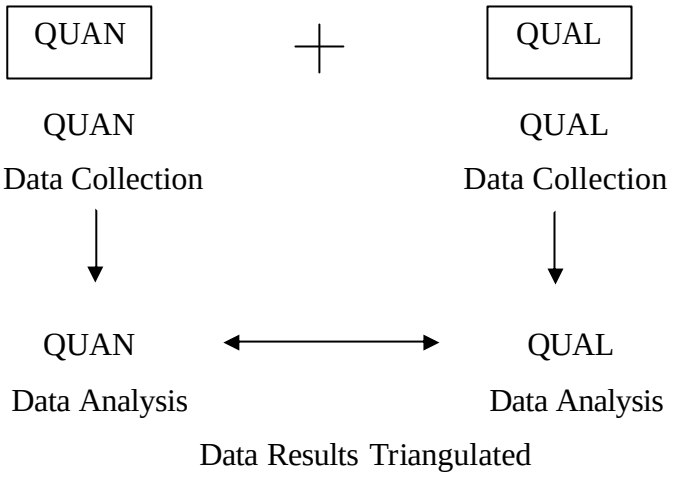

Figure 3.1 Data Collection Procedure

As mentioned before, online ITCP had four semesters. Each semester lasted two months and two courses were given in each semester. At the end of each semester, participants came to the university campus for two days. On the first day, face-to-face session to explain and discuss each course topics was given by the course instructors to the participants in two hours and on the second day, participants took paper-based final examination for each course. During these face-to-face days, researchers conducted semi-structured interviews with selected participants in the department of computer engineering. Before the face-to-face meetings, selected participants were contacted with e-mail and given a description of the study. During the interviews, each participant was asked with a few leading questions and then started to ask the questions in the interview schedules. Entire conservation was recorded by recording device with the permission of the participants. Each interview took average of nearly 20-30 minutes for each participant. Similarly, researcher got an appointment from each course instructor with e-mail and gave a description of the study. After given face-to-face courses, researcher conducted semi-structured interviewes with the course instructors at their office in the department.

In addition to interviews, after face to face sessions and exams of the courses at the end of each semester, the participants were required to fill out the web-based questionnaire through the Internet which was related to their satisfaction. Table 3.2 shows detailed information about the data collection process from the beginning to the end of the study.

Table 3.2 Information about the data collection process

Time	Instrument Name	Data Collection Method
At the beginning of the program (October 2004)	• Prior Knowledge Questionnaire, • Readiness for Online Learning Questionnaire, • Online Technologies Self-Efficacy Scale, • Locus of Control Scale	Online Questionnaire
At the end of the first semester of the program (December 2004)	• Student Satisfaction Questionnaire	Online Questionnaire
At the end of the first semester of the program during face to face meeting (December 2004)	• Semi-structured interview with three participants • Semi-structured interview with two course instructors	Interview
At the end of the second semester of the program (March 2005)	• Student Satisfaction Questionnaire	Online Questionnaire
At the end of the second semester of the program during face to face meeting (March 2005)	• Semi-structured interview with three participants • Semi-structured interview with two course instructors	Interview
At the end of the third semester of the program (May 2005)	• Student Satisfaction Questionnaire	Online Questionnaire
At the end of the third semester of the program during face to face meeting (May 2005)	• Semi-structured interview with three participants • Semi-structured interview with two course instructors	Interview
At the end of the fourth semester of the program (July 2005)	• Student Satisfaction Questionnaire	Online Questionnaire
At the end of the fourth semester of the program during face to face meeting (July 2005)	• Semi-structured interview with three participants • Semi-structured interview with two course instructors	Interview

3.6 Data Analysis

3.6.1 Quantitative Data Analysis

Quantitative data were collected through online self-reported instruments in the study. In the collected quantitative data, there were four independent variables and one dependent variable. Participant perceptions of online technologies self-efficacy, online learning readiness, locus of control and prior knowledge about program courses were independent and continuous variables. These were measured at the beginning of the program with online questionnaires. Satisfaction was dependent and continuous variable. It was measured at the end of consecutive semesters of program with online questionnaire. To analyze data deeply, after giving descriptive results, some inferential statistics were used. For example:

The following analyses were used for the research question 1, 2 and 3:

- Bivariate analyses using the Pearson Product-Moment Correlation technique to determine the strength and direction of the relationship between predictor variables and dependent variables.
- Multivariate analyses using Multiple Linear Regression technique to determine the strength and direction of the relationship between predictor variables and dependent variables.

The following analysis was used for the research question 4:

- Repeated measures analyses using Repeated Measures Analysis of Variance to examine whether there were differences in participant satisfaction across a program.

3.6.2 Validity and Reliability of Quantitative Data Analysis

Quality of research depends on two common issues: validity and reliability. Validity refers to the degree to which a study accurately reflects or assesses the specific concept that the researcher is attempting to measure. Essentially, validity

entails the question whether your measurement process, assessment, or project actually measure what you intend it to measure. Reliability is the extent to which an experiment, test, or any measuring procedure yields the same result on repeated trials (Gall, Borg, & Gall, 2003).

In research, validity has two essential parts: internal and external. Internal validity refers to whether or not the effects you obtain in your study are due to your conceptual variable. If there are alternative explanations to your data then the study does not have internal validity. External validity refers to whether or not the results can be generalized to people and situations outside of the specific participants and situations of the research, often called "generalizability". Major ten extraneous variables can interfere with especially internal validity: (a) subject characteristics, (b) mortality, (c) location, (d) instrumentation, (e) testing, (f) history, (g) maturation, (h) subject attitude, (i) regression (j) implementation (Fraenkel & Wallen, 2000). Researcher tried to minimize these threats by (1) standardizing the conditions of data collection and implementation, (2) obtaining information on the relevant characteristics of subjects and use the information to assist in interpreting the study, (3) obtaining more information on the details of the study and (4) choosing an appropriate design (i.e. mixed method in this study). These suggestions for minimizing threats are stated to help researchers by Fraenkel and Wallen (2000) in their book. In addition, this study results are not generalized to all online learning environments due to the external validity. The findings may be used for only similar online certificate programs.

Reliability is the extent to which a measure will produce consistent results in the research. Therefore, instruments used in the research are important for reliability. A reliable instrument will provide consistent measures of a person as long as there is no change in the person on the dimension or characteristic being measured. In the literature, there are some of the forms of reliability that the researcher will need to address especially while developing instruments to use in the research: inter-rater or inter-observer, test-retest, parallel-forms or alternate-forms, tests for homogeneity or internal consistency (Fraenkel & Wallen, 2000). All instruments

used in this study were selected by guidance of expert in the field. These instruments were not developed from the beginning to collect data in this study. Only two instruments (online technologies self-efficacy scale and readiness for online learning questionnaire) were translated to suit the subjects in the present study. After translating each item of these instruments into Turkish by the researcher and bilingual Turkish educator, a pilot study was conducted. According to the pilot study, the reliability of these instruments was found as satisfactory. Reliability is often at risk when assessments are taken over time, performed by different people or the assessments are highly subjective. In this study, standardized questionnaires generally were used to collect the data from the same participants by the same researcher during the research. In conclusion, in all processes reliability and validity concerns tried to be taken into consideration by the researcher during this study.

3.6.3 Qualitative Data Analysis

Qualitative data were collected through semi-structured interviews in the study. The transcripts of the interviews were analyzed according to the qualitative analysis procedures. Marshall and Rossman (1999) stated analysis of data includes ordering, structuring, and interpreting the mass of collected data. The six steps while analyzing the data are followed as suggested by them: 1) organizing the data; 2) generating categories, and themes; 3) coding the data; 4) testing the emergent understandings as considering students' individual differences; 5) searching for alternative explanations; and 6) writing the report. Similarly, Herrington and Oliver (2000) provided the process of coding the data for qualitative analysis. The transcripts of all interviews were also analyzed according to this process given below:

- *Coding*: individual comments are coded due to the research questions
- *Ordering and displaying*: information is collected, patterns and themes are determined. Data are displayed when ready
- *Conclusion drawing*: Conclusions are drawn according to the data gathered and they are written up.

- *Verifying*: By reviewing the original data, conclusions are verified.

During the data analysis in this study, the researcher tried to follow above steps carefully. At the beginning of the analysis phase, researcher read all the transcripts of interviews again and again. Similarly, Marshall and Rossman (1999) mentioned in organizing data as "reading, reading, and reading once more through the data forces the researcher to become familiar with those data in intimate ways" (p.153). During the first readings, researcher took notes, carried out editing necessary and cleaned some unnecessary data from raw data. These helped the next phase of data analysis, generating categories, and themes.

After having a general appearance of the data, researcher started the coding process. "Coding data is the formal representation of analytic thinking." (Marshall & Rossman, 1999, p.155). Researcher went through data for regularities and patterns and wrote down words or phrases to represent the patterns. These were a means of sorting the descriptive data. The first coding process of transcripts was not conducted as considering the categories. At this stage, the main themes only started to come out.

After coding process was completed, all interview transcripts were scanned again. Before determining the main categories, researcher went back to data and recoded some parts of it, and the most descriptive wording for coding data was given. With the help of the coding, the main categories were extracted in both participants' and instructors' transcripts. Actually, the phases of coding the data and generating categories were conducted as a combined way. As a summary, there were four main categories related participant satisfaction which were interaction, course structure, institutional support and flexibility in participants' transcripts. Similarly, there were five main categories in instructors' transcripts. Four of them were the same. The last category was related to online participants.

In data analysis, a final step involved making an interpretation or meaning of the data (Creswell, 1998). An overall portrait of participants' and instructors' views

was constructed where conclusions and implications were stated based on data in this step. These statements were examined together for specific meanings in relationship to the purposes of the study.

Additionally, asynchronous and synchronous communication transcripts were examined to find out the level of participation to the online communication in the program. Participants' and instructors' discussion logs were saved in databases digitally in each course during the program. The researcher analyzed these transcripts from chat sessions and discussion list logs individually. The messages in the online communication were counted and displayed into tables.

3.6.4 Validity and Reliability of Qualitative Data Analysis

Patton (2001) stated that validity and reliability are two factors which any qualitative researcher should be concerned about while designing a study, analyzing results and judging the quality of the study. In other words, validity and reliability are important issues in qualitative research studies in order to be trustworthiness of a research (Merriam, 1998) like in quantitative research.

Validity concerns the issue whether or not the findings can be shown to be valid for the problem that is being investigated. Merriam (1998) recommended six strategies for enhancing validity in qualitative research: i) Triangulation, ii) Checks, iii) Long-term observation, iv) Peer examination, v) Collaborative models of research, vi) Researcher's biases.

In order to increase validity, researcher tried to follow these six strategies during this study. For example, he used many different types of data collection, such as online questionnaires, interviews with participants and instructors, asynchronous and synchronous communication transcripts. The interview questions and schedule were prepared by taking experts' reviews and also asked peers to help design a successful interview schedule and check all process. All interviews were recorded with the consent of the interviewees. Further, all interviews were

transcribed by the researcher carefully and irrelevant answers during interviews were ignored from the transcripts. Later, transcripts were showed to the participants and instructors in order to check their views. Moreover, the data analysis process was reviewed by an expert and a peer (a Ph.D candidate) at the department of Computer Education and Instructional Technology, especially during coding data and generating categories. In addition, the raw data were coded more than once by the researcher at different times to compare the codes in terms of their consistency. Also, researcher's bias could never fully be removed; but an awareness of personal biases was acknowledged during the study.

Reliability is the extent to which research findings can be replicated. Guba and Lincoln (1989) suggested different terms for discussing research reliability in qualitative studies, such as, dependability and consistency and four criteria for judging reliability of study are stated: i) credibility, ii) transferability, iii) dependability, iv) confirmability.

In order to increase reliability, the researcher used these four criteria during this study. Credibility is demonstrated through a number of strategies: member checks, peer debriefing, prolonged engagement, persistent observation and audit trails (Lincoln 1995). Member checking and peer debriefing addressed credibility when the transcripts were showed to the participants and instructors and peers helped in data analysis. Transferability refers to the generalizability of study. It might be achieved by providing descriptive detail to allow readers to decide if the results are applicable to other cases. However, there is no attempt to generalize results. This study results or implications only can be applied to similar programs, especially certificate programs. Dependability is achieved through a process of auditing. It was addressed in the study by keeping detailed records of the data collection and analysis procedures. Transcripts were created from the audiotape of the interviews, and all documents and notes were retained for inspection. Confirmability was addressed in the study by including excerpts from raw data that supported interpretations and conclusions. In conclusion, in all processes

reliability and validity concerns tried to be taken into consideration by the researcher during this study.

3.7 Assumptions and Limitations for the Study

For this study, the following assumptions are stated:

- The participants responded accurately to all the instruments used in this study.
- Reliability and validity of all the questionnaires and interview schedules used in this study are accurate enough to permit accurate assumptions.
- The data were recorded and analyzed accurately.

The following limitations were applied to the present study:

- This study is limited to the participants who enrolled to the online certificate program in 2004-2005 at Middle East Technical University.
- Validity of this study is limited to the reliability of the instruments used in this study.
- Validity and reliability was limited to the honesty of the participant's responses to the questionnaires.
- Generalizations will only be able to be made to the participants enrolling in this certificate program.

CHAPTER 4

RESULTS

In this chapter, the results of the study in regard to the research questions are presented. At the end of the chapter, the findings of the study are summarized.

4.1 The Factors Affecting Participants in Choosing Online ITCP

At the beginning of the program, a questionnaire with demographic was given to the participants to collect participants' demographics and to determine the factors affecting them in choosing this online certificate program. It had alternative responses from which participants can select more than one. As seen Table 4.1, "To learn information technology or to renew my knowledge about information technology" was one of the most influential factors in choosing online ITCP for 41.3 % of the participants. 23.1 % of the participants expressed that they would be more productive in their present job or they would make progress in their existing career with attending this online certificate program. Also, 18.3 % of the participants stated that getting a reference for their academic education was another factor for their choosing online ITCP. According to the participants, creating a second job chance and finding a job was the lowest factors that affect them in choosing online ITCP.

Table 4.1 The factors affecting the participants in choosing online ITCP

	N	%
To learn information technology or to renew my knowledge about information technology	43	41.3
To be more productive in my present job or to make progress in my existing career	24	23.1
To get a reference for my academic education	19	18.3
To create a second job chance, having already a job	13	12.5
To find a job	5	4.8

N: Number of participants, %: Percentage of participants

In addition, participants wrote in the open-ended part of the online questionnaire that “proving my knowledge with this certificate" stated by three participants, “creating a second expertise field apart from my existing expertise field” stated by three participants, and “preparing various projects in this program” stated by two participants were other factors that affect them in choosing online ITCP while registering the program.

4.2 The Participants’ Perceptions of Online Technologies Self-efficacy, Online Learning Readiness, Locus of Control, and Prior Knowledge about Program Courses

The participants’ initial perceptions were analyzed to answer the first research question in the study. To collect relevant data, four online questionnaires were used at the beginning of the program. These questionnaires measured participants’ self-efficacy beliefs specific to the online environment, participants’ readiness for online learning, participants’ locus of control orientation, and participants’ prior knowledge about program courses respectively.

Table 4.2 showed descriptive statistics (i.e. range, min, max, mean, standard deviation) on the participants’ perception of online technologies self-efficacy, online learning readiness, locus of control, and prior knowledge about program courses at the beginning of the program. According to the results, participants had

quite high perceived online technologies self-efficacy (mean = 106.14 out of 116). Most participants thought that they were ready for online learning (mean = 42.74 out of 52), and also participants had mainly internal locus of control (mean = 8.17 out of 23). Moreover, most participants stated that they did not have much knowledge about program courses at the beginning of the online certificate program (mean = 14.27 out of 32).

Table 4.2 Descriptive statistics

Predictors	N	Range	Min	Max	Mean	Std.
online technologies self-efficacy	60	53	63	116	106.14	11.7
online learning readiness	62	22	30	52	42.74	4.99
locus of control	58	16	1	17	8.17	3.88
prior knowledge	63	20	8	28	14.27	5.09

4.3. The Participants' Satisfaction Level in the Program

The participants' satisfaction in regard to learner-learner interaction, learner-instructor interaction, course structure, institutional support, and flexibility, based on semester one, two, three and four in online Information Technologies Certificate Program (ITCP) were the second research question in the study. To collect relevant data, Online Student Satisfaction Questionnaire was used at the end of each semester in this online program.

The results of the second research question were discussed based on Table 4.3. Table shows that with an overall mean score (out of 5) from 0.00 to 1.80, participants strongly disagreed with the statements. With an overall mean score from 1.81 to 2.60, participants disagreed with the statements. With an overall mean score from 2.61 to 3.40, participants were netural with the statements. With an overall mean score from 3.41 to 4.20, participants dagreed with the statements. Also, with an overall mean score from 4.21 to 5.00, participants strongly agreed with the statements.

Table 4.3 The intervals of the mean scores (out of 5)

	S. Disagree	Disagree	Neutral	Agree	S. Agree
Mean scores	from 0.00 to 1.80	from 1.81 to 2.60	from 2.61 to 3.40	from 3.41 to 4.20	from 4.21 to 5.00

Table 4.4 presented the participants' satisfaction in regard to learner-learner interaction, learner-instructor interaction, course structure, institutional support, and flexibility. The participants' overall satisfaction scores were M=3.5; M=3.5; M=3.4; and M=3.2 at consecutive semesters one, two, three and four indicating that majority of the participants agreed with the statements for the first, second and third semesters but they were neutral for the fourth semester. When overall satisfactions of the participants in regard to satisfaction themes were examined, learner-learner interaction had the lowest mean (M=2.9), and course structure had the highest mean (M=3.9). The results also indicated that the participants disagreed that the fourth semester's courses were flexible enough (M=2.3) in the program.

Table 4.4 The participants' satisfaction in the semesters of the Online Certificate Program

	Semester-1		Semester-2		Semester-3		Semester-4		Overall	
	M	SD	M	SD	M	SD	M	SD	M	SD
Learner-learner interaction	2.7	1.0	2.8	1.1	2.9	1.0	3.0	1.1	**2.9**	**1.1**
Learner-instructor interaction	3.6	0.7	3.7	0.9	3.6	1.0	3.5	1.1	**3.6**	**0.9**
Course structure	4.1	0.8	4.1	0.8	3.8	0.9	3.6	0.9	**3.9**	**0.9**
Institutional support	3.4	0.8	3.4	1.1	3.5	0.9	3.4	1.0	**3.4**	**1.0**
Flexibility	3.9	0.8	3.7	1.1	3.1	0.9	2.3	0.9	**3.3**	**0.9**
Overall Satisfaction at the end of each semester	**3.5**	**0.8**	**3.5**	**1.0**	**3.4**	**0.9**	**3.2**	**1.0**	**3.4**	**0.9**

M: Mean, SD: Standard Deviation

4.4 The Relationship between Participant Perceptions and Participant Satisfaction

The nature of the relationship between participant perception of online technologies self-efficacy, online learning readiness, locus of control, prior knowledge about program courses and participant satisfaction in online Information Technologies Certificate Program (ITCP) were the third research question in the study. In order to analyze the nature of the relationship among variables, Pearson Product Moment Correlation and Linear Stepwise Regression analysis were employed at a significance level of 0.05.

First, Pearson Product Moment Correlation to examine the interrelationships among measures was conducted in the study. The correlation matrixes among measures were presented in Table 4.5. The findings showed that the participant perception of online technologies self-efficacy correlated statistically significant with their perception of online learning readiness, locus of control and prior knowledge. Also, the correlation between locus of control and other variables was generally negative. It means that participant perception of locus of control was internal locus of control. For instance, participant perceptions (i.e. online technologies self-efficacy) correlated with internal locus of control beliefs positively. Moreover, the results of the study demonstrated that participant perception of online learning readiness was only one variable that correlated statistically significant with participant satisfaction. Also, the predictor variables did not have high correlation among themselves; therefore, multicollinearity was not a problem in this study.

Table 4.5 Pearson product moment correlation among measures

Variables	**2**	**3**	**4**	**5**
1. online technologies self-efficacy	0.48*	-0.3*	0.36*	0.19
2. online learning readiness		-0.19	-0.14	0.33*
3 locus of control			-0.23	-0.16
4. prior knowledge				0.03
5. satisfaction				1

*p<0.05

Second, Linear Stepwise Regression analysis was used to assess how well participant satisfaction can be explained in terms of participant perception of online technologies self-efficacy, online learning readiness, locus of control, and prior knowledge about program courses. As Table 4.6 indicates, a variable (online learning readiness) explained a significant variance in participant satisfaction, R^2=0.092, adjusted R^2=0.072, F (1, 47) = 4.75, p=0.03. 9.2 percent of the variances were explained by this variable. The value of Standardized Coefficients was 0.3 and Standard Error was 27 for this variable.

Table 4.6 Linear Stepwise Regression Analysis Results

Regression Statistics					
Multiple R	0.303				
R Square	0.092				
Adjusted R Square	0.072				
Standard Error	27.06				
	Df	SS	MS	F	Sig F
Regression	1	3476.10	3476.10	4.75	0.03*
Residual	47	34420.91	732.36		
Total	48	37897.01			

*p<0.05

Participant perception of online technologies self-efficacy, prior knowledge, and locus of control were excluded from the equation of predicting satisfaction since they did not have a significant contribution to variance in participant satisfaction ($p>0.05$). Table 4.7 shows the results of linear stepwise regression analysis of excluded variables.

Table 4.7 Results of linear stepwise regression analysis of three excluded variables

Variables	Beta In	T	p-value	Partial Correlation	Tolerance
Online technologies self-efficacy	0.041	0.252	0.802	0.037	0.758
Prior knowledge	-0.047	-0.324	0.747	-0.048	0.925
Locus of control	-0.112	-0.792	0.433	-0.116	0.965

4.5 The Changes (Variations) in the Participant Satisfaction throughout the Program

The fourth question in the study was whether participant satisfaction change throughout online Information Technologies Certificate Program (ITCP) based on semester one, two, three, and four. In order to answer this question, a repeated measure analysis and t test was employed at a significance level of 0.05.

The repeated measure analysis indicated that there was no significant difference among the means of four semesters in regard to *learner-learner interaction*, $F(3, 87) = 0.82$ $p=0.48$; *learner-instructor interaction*, $F(3, 87) = 0.65$ $p=0.58$ and the *institutional support*, $F(3, 87) = 0.28$ $p=0.83$.

In regard to satisfaction on *course structure*, the repeated measures analysis showed that there was a significant difference among the means of four semesters, $F(3, 87) = 7,2$ $p=0.00$. Course structure measures decreased especially during the last two semesters. In order to find out the means differ from each other at a significant level, a paired-samples *t* test was used. The *t* test results indicated that there was a significant mean difference between the first and the fourth semesters

(*p*=0,03), the second and the third semesters (*p*=0,013), the second and the fourth semesters (*p*=0,01), and the third and fourth semesters (*p*=0,023) on course structure satisfaction.

The repeated measures analysis also indicated that there was a significant difference among the means of four semesters for the *flexibility* measures, F (3, 87) = 26.86 *p*=0.000. Flexibility measures decreased gradually throughout the semesters. The paired-samples *t* test was used to find out the means differ from each other. The results showed that there was a significant mean difference between the first and the third semesters (*p*=0.001), the first and the fourth semesters (*p*=0.001), the second and the third semesters (*p*=0.001), the second and the fourth semesters (*p*=0.000), and the third and the fourth semesters (*p*=0.000) in regard to satisfaction in flexibility.

The results of the study showed that there was a statistically significant decrease, F (3, 87) = 5.35, p= 0.002 in *overall satisfaction* of the participants throughout the program. As it is shown in Figure 4.1, overall satisfaction decreased gradually from the first to the fourth semesters. The paired-samples *t* test results showed that there was a significant mean difference between the first and the fourth semesters (*p*=0.01), the second and the fourth semesters (*p*=0.008), and the third and the fourth semesters (*p*=0.005) in regard to overall satisfaction of the participants.

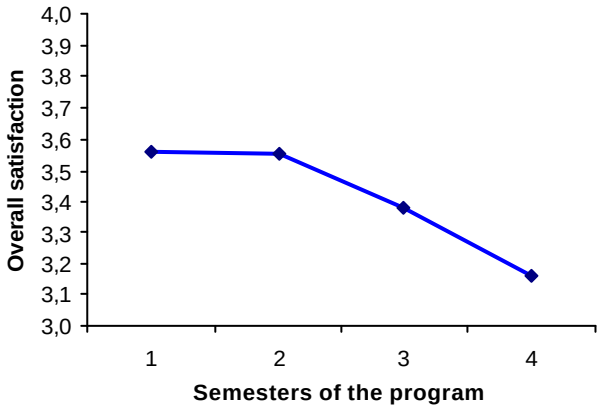

Figure 4.1 Participants' overall satisfaction in the semesters of the online program

4.6 Participants' Views about Satisfaction in the Program

The participants' views about satisfaction in online Information Technologies Certificate Program (ITCP) were the fifth research question in the study. Semi-structured interviews were conducted to examine the factors that contribute to the participants' satisfaction in the Online Certificate Program. Results were reported under the four main themes: interaction, course structure, institutional support and flexibility.

Interaction

In this online certificate program, mainly asynchronous (e.g. discussion list, e-mail) and synchronous (e.g. chat sessions) communication tools were used to facilitate interaction among the participants, and between the participants and instructors. The interview results showed that computer mediated communication (CMC) tools were beneficial for the participants learning process. They could ask their questions about any topic, any time. All participants thought that learning with interaction through CMC tools was one of the major benefits of online learning when it is compared to learning from texts by themselves.

Participants used these communication tools for various interaction purposes in this online program. For instance, e-mail was used by the participants only to ask about specific issues that were primarily related to their personal problems. In other words, participants used e-mail communication when the content of the e-mail was not related to all participants; otherwise, they preferred to use course discussion lists and chat sessions.

Participants used the discussion list mostly to ask questions when they were faced with problems related to course topics. Almost all participants expressed that the discussion lists were the most useful and preferable tool in this online program. Five of the participants stated that they wrote messages and received answers in a short time in the discussion lists, and more active environments were created.

Also, two participants mentioned that they could write longer messages in the discussion list compared to the chat sessions. Therefore, they could discuss more topics in a detailed way. According to four participants, another major advantage of discussion lists was that in the discussion lists, participants could see others' problems and solutions which they might also have faced. Moreover, they were aware of the course announcements, assignments, and exams through the messages posted in the discussion list.

With the chat sessions, participants could ask questions and get immediate answers in real time. Original and natural discussion environment similar to the face-to-face environment could be created in this way. Two participants mentioned that they could ask questions to the instructors directly, like in face-to-face environments.

Under interaction theme, there were two sub-themes extracted from participants' interview results: learner-learner interaction and learner-instructor interaction. These two sub-themes were presented respectively.

Learner-learner interaction

The findings of the interviews supported the findings of the questionnaire on interaction in this study. Almost all participants expressed that the interaction among the participants was not enough. They stated that they did not know each other much, and did not have a continuous conversation. For example, one participant stated *"I have few friends and we are not much close to each other in the program.* [S-1]" Another participant said that *"I talk with few people only about their jobs, their aims attending this program, and our conversation is so superficial.* [S-2]"

Although the interaction among the participants was weak in the program, participants wanted to interact among themselves during the program. Five participants thought that the participants in the program could help each other by

using communication tools. For example, one participant mentioned that "*We could assist each other while doing our homework, studying for the exams, and solving the problems we faced with the course notes.* [S-3]" Moreover, two participants wanted to talk to each other about any topics in addition to course notes, e.g. computer news, innovations or daily topics. Even though the participants were eager, the majority of them did not get help from and interact with others often during the program.

In the program, there were some facilities for the participants to interact with others as well. For instance, some participants met each other during the orientation program given at the beginning of the program. However, three participants expressed that the orientation program was not enough for meeting all of the participants. The participants indicated that they generally saw and talked with each other during the face-to-face meetings at the end of semesters. However, two participants mentioned that face-to-face programs lasting two days were too short and very dense. For example, one of them stated that

> *"Participants come from different cities, so, they may be tired in the first day. Additionally, they generally attend two courses in the first day, and there are two exams in the second day. They have to study for these exams. For these reasons, time is limited during the face-to-face programs and participants prefer to deal with the courses instead of interacting with others.* [S-4]"

Some of the participants mentioned that they sometimes attempted to interact with others in the program. For instance, they tried to interact and meet with others during the face-to-face courses at the end of the semesters. One participant stated that *"During the face-to-face courses, I tried to meet with some participants who he did not see before but talked at the chat sessions or discussion lists.* [S-5]" Also, some participants submitted their ICQ numbers to ICQ club web sites in the program, and two participants attended program chat rooms two or three times randomly, but they did not encounter with the other participants. One of them mentioned that *"I sometimes login to the chat tools but there are no participants*

in the chat room. To talk or discuss the topics with someone synchronously, you have to be close with them and you should decide the login time together by using e-mail. [S-6]*"* It can be concluded that although some participants tried to interact with others, they were not much successful to increase interaction with other participants.

The participants mentioned that there were several reasons for the low level interaction among the participants. The first reason was due to the nature of the program that it was an online program. Although there were face-to-face and chat sessions for each course in the program, participants did not meet face-to-face continuously. They were not at the same place physically. Also, they generally attended course web sites asynchronously; therefore, they generally were alone during their learning process. Moreover, they stated that the progress of interaction among the participants over the Internet took more time compared to face-to-face interaction. One participant stated that *"Interaction might be broken off due to the Internet-based education. It is difficult to increase the interaction among people when they can not be at the same place physically and they can not spend time together.* [S-7]"

The second reason was as stated by four participants that almost all participants had different responsibilities, and had various occupations in their life. They were busy, their life was dense, and their mind was full. Further, they stated that their background, previous knowledge levels, ages and occupation were different. The participants were over 18 and mostly set a different direction in their lives. This might influence the low level of interaction with others.

As the third reason, three participants stated that there were not enough activities to have interaction among the participants in the courses, so they could not find common topics to talk to each other and they might not improve their interaction. One participant said that

> *"Participants do not know each other, so our conversation is too short. For instance, I am trying to talk with some participants by using MSN tool.*

I sometimes ask to them 'what are you doing today in the program and I did those,' but after a short time, our conversation is finished due to the little shared activity. [S-8]"

Fourth, two participants mentioned that they preferred to study alone. They did not need to interact with others much; therefore, they only read communication log files, and then attended interaction. One participant expressed that "*I think that interaction is not much necessary while taking online courses or studying by ourselves.* [S-9]"

Fifth, some participants generally preferred to communicate with others who had common background or who knew each other before the program. For instance, one participant stated that "*There are 4-5 participants who are students at the same university. Their communications among themselves are well and they generally prefer to talk to each other.* [S-10]"

The majority of participants stated that the learners should be given more opportunities to know each other in this type of program. To help them know each other, background information of the participants might be shared as soon as the program starts. Additionally, interaction in the online environment should be encouraged by the instructor and the assistants. One participant mentioned that "*Some activities might be designed to increase interaction among the participants. Moreover, activities that require group work may be designed, and instructors can assist the participants if they need help in forming a group.* [S-11]"

Learner-instructor interaction

Most participants agreed that they were satisfied about the interaction with the instructors in all semesters of the program. Six participants mentioned that the instructors replied to their messages quickly, and they were quite satisfied with

timely feedback. One participant mentioned that *"When I ask questions, they try to help me. For instance, when I send e-mail, they reply in a short time.* [S-12]*"*

Participants generally interacted with the course instructors and assistants about the requirements of the courses with which they had problems. They needed help from the instructors when they did not understand the course notes, exercises, and assignments. Four participants stated that they generally preferred writing messages in the course discussion lists instead of using other tools for communication, and interacted with the courses most of the time. One of them stated that *"I have generally written message to course discussion lists about course related issues, i.e. homeworks, exams [S-13]".*

Most of the participants interacted with course assistants in the discussion lists and interacted with course instructors during the chat sessions and the face-to-face courses. There were four chat sessions for each course. Course instructors discussed the weekly course topics during the chat sessions. Each course had two face-to-face meetings at the beginning and at the end of each semester. Participants were satisfied with these face-to-face courses, especially the ones at the end of the semester. Majority of the participants expressed that the instructors explained the course topics thoroughly and their difficulty in understanding became clearer in these face-to-face sessions.

Five participants stated that *"not studying regularly, difficulty in learning the subject, and dominant students.* [S-14]" hindered their interactions with the instructors. They mentioned that if they did not study regularly, they could not interact successfully in the courses. Two participants indicated that some courses were too difficult for them and they could not understand the topics. Therefore, they could not know what to ask or how to ask questions. It was reported by two participants that they might sometimes hesitate to attend discussions in order not to ask unrelated or silly questions. Another reason stated by the participants was that participants who had more knowledge wanted to ask more and complex

questions, and they wanted to be dominant and more active; therefore, some participants did not attend the discussions.

Course Structure

The results showed that most participants were satisfied with eight week course contents that contained various materials (e.g. exercises, assignments and references books) at beginning courses. However, the results demonstrated that participants' thoughts were changing and their satisfaction was decreasing throughout the program.

In the first semesters, participants generally mentioned about positive aspects of courses. One participant stated that *"Weekly course contents are well designed. They are not too long or they are not too brief. They keep us busy in all week without being bored.* [S-15]" Also, eight participants expressed the importance of exercises and assignments in the course contents. They stated that exercises and examples in the courses helped them learn the topics. With the help of preparing weekly assignments, they studied the course notes regularly, so that they could already be prepared the exams. In addition to the course notes given in the web sites, textbooks related with each course were recommended in the program. Participants stated that they could read recommended chapters in the textbooks when they needed more information about course topics. One participant expressed that

> *"Course contents in the web sites are given as a summary; they are designed to support course textbook. After covering each week's topic, related chapters in the textbooks are recommended to read more detailed information. I think this is a proper way for us since we are getting prior information about course contents from the web sites, then, we can improve ourselves by reading more detailed and complex structures in the textbooks.* [S-16]"

Even though there were mostly positive thoughts about the course structure, some participants found deficiencies especially in courses in the last two semesters' courses. First of all, some participants complained about the content of these courses. Four participants mentioned that these courses consisted of too much general information and the content, examples, and exercises were not sufficient to understand the topics. Participants thought that even though they studied the course notes they had to improve themselves more. They had to read textbooks and investigate other web sites in the Internet to understand these concepts. These brought extra difficulties for the participants while they were studying. Three participants stated that courses, especially during the third semester, contained too much conceptual information. They could not understand them easily. For instance, one participant mentioned that *"There are lots of concepts in the software engineering course. I can not understand all concepts or I can not establish connection among these concepts.* [S-17]*"*

Another concern of the participants was about the examples given in the courses. They thought that course examples were not applicable and practicable, and they could not apply what they learned. The other problem mentioned by the participants was the language errors in the course notes. They mentioned that there were spelling and grammar problems in the course notes due to the translation of the materials from English to Turkish. That disturbed the participants. One participant stated that *"I am satisfied with the courses in the beginning of the program but the contents of the subsequent courses consisted of more translated sentences.* [S-18]*"* One of the participants summarized the problems in the courses: *"I think that the first two courses are well prepared. The problems start to arise in the second semester courses, the problems are seen thoroughly in the third semester courses, and we are broken off at the last semester.* [S-19]*"*

Another problem stated by the participants was about the duration of the program. They indicated that the program had a heavy and intensive curriculum since eight different courses were given in nine months. They could not grasp all the course

topics in this limited amount of time. Also, a problem stated was the increased difficulty level of the courses from one semester to the next. Participants were expected to learn more than they could achieve in one semester. Although they spent a lot of effort to do the assignments, especially in the last two semesters, they had difficulties to fulfill the requirements. One participant stated that *"I am successful in Computer Programming with C course (CPC) and I think I would be successful in Data Structure and Algorithms with C course which is subsequent of CPC, but I can not.* [S-20]"

Moreover, some participants thought that they needed more prerequisite knowledge to be successful in some courses. One participant stated that *"I think that we needed more background knowledge to be successful especially at the last courses, but the program did not provide us with this knowledge prior to our attendance in the course.* [S-21]" For example, there were some problems about software development project course given at the last semester. This course was different from the other courses in some ways. Based on the seven course topics, participants developed a software project step by step, either alone or within a group. Although they mentioned that they exerted much effort in developing software project in that course, some of them could not be successful.

Participants suggested that course notes including examples, exercises and conceptual information should be provided to the students to support online learning. These notes should be clear, understandable to all and visual.

Institutional Support

The results showed that majority of participants were satisfied with institutional support in the program. According to the results, participants agreed that they generally got response to their questions during the program. All kinds of problems, i.e. administrative, educational, communication were tried to be solved by the program coordinators and instructors. For instance, one participant stated that *"I needed receipt about program payments; they sent it to me in a short time.*

Additionally, I stated my request about the courses during the chat session and it is accepted both by the instructors and program coordinators. [S-22]*"*

According to the participants, this program provided many learner support activities to the participants during their education. During the registration period, participants were informed about all the necessary issues and procedures. During the orientation program, the course instructors met with the participants, and provided information about the program's properties. Moreover, there were some facilities for participants who could not attend to face-to-face exams. If the participants could not attend to face-to-face exams at the end of the semester, two more exams for each course were given to the participants at the end of the subsequent semesters. In addition, participants' opinions about program activities and courses were gathered by surveys regularly at the end of the semesters.

However, there were some insufficiencies about online support systems as stated by the participants. Three participants expressed that there was not enough individual feedback in the program. One participant stated that *"Individual feedback can be given especially about our homework results. We want to learn what our mistakes are in homework.* [S-23]*"* Furthermore, three participants mentioned that they sometimes needed immediate feedback while studying the course materials. If their questions were not solved at that time, they sometimes could not continue to study their courses.

Participants made some suggestions to improve the support systems in the program as well. According to some participants, it might be helpful when participants were guided by the instructors individually during each course. For instance, one participant stated that *"Instructors or coordinators may communicate with the participants directly who do not submit their assignments or do not attend chat sessions. If there is a problem related to the program, they can help them.* [S-24]*"* Furthermore, four participants mentioned that they needed more synchronous activities in the program. For example, number of chat sessions in each course might be increased; therefore, participants could attend suitable

sessions. Two participants stated that one more face-to-face course session on the campus of university might be organized in the middle of each semester.

Flexibility

The results showed that the majority of participants mentioned about advantages of flexibility of online program in the firsts semesters. Over the semesters, they stated that this program brought some difficulties to the participants as well.

The major flexibility of the program for almost all participants was that they were not obligated to attend a place or a school psychically to take the courses. Four participants stated that they could study whenever and wherever they desired with this internet based program. Five participants expressed that they could arrange their time during their education. Such kinds of education provided them to study and learn their desired courses at home or work. Also, this program helped them learn eight basic computer engineering courses systematically.

Participants' thought about flexibility of program was changing over the semesters in the program. Four participants mentioned that this education placed all responsibilities on the participants. They learned the content through the course materials and tried to apply them to new situations. One participant stated that they were not used to learning in this method and it may not be proper for all participants. Another participant expressed that *"I would prefer to learn the course content by listening and seeing rather than reading. Especially, I could attend laboratory sessions in front of computers in the programming courses, so these courses would be more beneficial for me.* [S-25]*"*

Furthermore, two participants mentioned that they exerted much effort to perform their program related requirements at the same time. Almost all participants complained that they could not spare enough time to the courses due to their other responsibilities, i.e. job, family. Some participants stated that they sometimes sacrificed their special things to study for their courses (i.e. their hobbies). In

addition, four participants emphasized that they had to study the course materials regularly. If they did not study the courses and perform their requirements regularly, they could not compensate them. They might stay behind all topics and might break off easily. After some time, the subjects to be studied were accumulated; therefore, they might not catch the others and loose their motivation to the courses. In such cases, participants might even leave the program. Another participant explained that *"I sometimes can not ask the questions that I have in my mind since the discussions in the discussion lists and chat sessions pass forward.* [S-26]*"*

In addition, participants were faced with some problems about synchronous activities in the program. For example, predetermined time period for chat sessions, face-to-face courses and exams were not suitable for some participants. Especially in the last semester, the day of face-to-face courses and exams were changed since there were other exams on campus. This change affected the participants' plan in a negative way since some participants arranged their time beforehand.

The participants wanted more flexibility over the semesters in the program. For example, the aim of the program is to give eight basic computer engineering courses to the participants, however, some participants expressed that rather than taking all of the courses they wanted to take the courses they needed. One participant stated that *"I prefer to attend courses on writing codes at a good level in one of the programming languages, i.e., C programming language in four or five months.* [S-27]*"* Moreover, one participant mentioned that some courses should be added to the program as an elective, e.g., computer network.

4.7 Instructors' Views about Satisfaction in the Program

The instructors' views about satisfaction in online Information Technologies Certificate Program (ITCP) were the sixth research question in the study. In the Online Certificate Program, eighth course were given by the instructors from

Computer Engineering Department at Middle East Technical University. Semi-structured interviews with these course instructors were conducted to examine their opinions about participants' satisfaction in this program. Results were reported under the five main themes: interaction, course structure, institutional support, flexibility and online participants.

Interaction

Instructors agreed that the major benefit of online learning was interaction in computer mediated communication tools (i.e. chat sessions, discussion lists) when compared to self-studying methods. They mentioned advantages and disadvantages of both chat sessions and the discussion lists that used in their courses. For example, they stated that the major advantages of discussion lists were asking easily any question anytime upon thinking deeply or by looking at course notes, and disregarding or cleaning unrelated messages easily. Further, they believed that the main advantage of chat sessions were asking questions and getting immediate answers in real time. According to their thoughts, new questions and new answers that could be more original or natural could be produced in this way; therefore participants could learn topics in a detailed way. On the other hand, they expressed that both communication types had only text-based properties, so participants, as well as instructors, need fast keyboard writing skills. In both types, instructors thought that participants sometimes hesitate to attend discussions in order not to ask unrelated or silly questions. Also, suitable pre-determined time for chat sessions for all participants is a major problem for synchronous communication in an online course.

Instructors thought that asynchronous (e.g. discussion lists) and synchronous communication (e.g. chat sessions) should be used complementarily to prove more beneficial in online learning since both of them have different weaknesses and strengths. In this program, they used both of them in their courses. One of the instructors summarized their methods about their interaction with the participants

in the discussion lists and chat sessions during their course. He mentioned their methods in the discussion lists*:*

> *"We usually use the discussion list to allow the students to direct their questions. Our purpose is to provide the opportunity for the other students to reply to those questions. The student directs his/her question whenever he/she likes and after a while we check whether another student replied to it or not. And of course we check those replies too. If the other students have replied the question correctly, then we do not intervene. But if there is anything that is wrong or that can be understood in a different way, then we politely correct those replies. We wait for a correct answer from the group for a while and in a short period of time we send the correct answer to the list*. [I-1]"

He also mentioned their methods in the chat sessions:

> *"We use chat sessions mostly to provide answers to the questions that the students instantly raise throughout a discussion. Of course it is also possible to manipulate those chat sessions too. This is because some topics are much harder to understand for the students. If I guess that a topic would be hard to understand for the students, I firstly wait for the questions of the students in the chat session. If the questions raised on the topic are not sufficient, then I ask the students, OK friends, we already mentioned this topic. Have you understood? Do you have any questions? or I will ask question related to the course topics and try to direct them in this way. Once I asked the students such questions, the questions follow each other and in this way we try to have the students grasp that topic appropriately.* [I-2]*"*

Like participants' views, instructors agreed that interaction was weak in the program and interaction in the course computer communication tools was not enough. According to them, participants who were successful and satisfied generally attended the discussions. They generally followed the course topics regularly. Also, instructors mentioned that there were several reasons why other

participants did not attend discussions. For example, one of the major reasons was that participants could access chat logs file anytime after chat sessions were completed. Also, participants might think that other participants would probably ask questions instead of them. Moreover, they expressed that some participants did not want to attend discussions since they knew the topic well or they had little knowledge about topics. Moreover, instructors stated that some participants wanted to be dominant in discussions; they wanted to ask more questions or answered each question in a detailed way. This might affect other participants. Another major reason was participants' hesitancy about writing messages. Participants might think that their message was too silly, their questions were too easy or their messages were not related to topics and so on.

Course structure

Instructors stated that they have tried to give eight basic computer engineering courses to the participants for eight years. They mentioned the process about designing and giving these online courses in this online program. From the beginning years, they knew that online education placed all major responsibilities on the students; therefore, they tried to create a more effective learning environment. Firstly, all of them expressed that designing and giving these online courses properly was not easy job for them when compared to traditional one. One instructor summarized designing and giving online course process with compared to traditional one as follows:

> *"It is very difficult to prepare courses in online education. It needed quite carefulness. Actually, it was similar to preparing books in some ways. On the other hand, various interactions should be prepared carefully in the course materials, and our materials should motivate the students in online courses. However, it is not easy since interaction in online environment is limited when compared to traditional one. You should find various methods to increase interaction and students' motivation in online courses.* [I-3]*"*

All instructors agreed that it was troublesome process for them to design online course materials at the first time, but, they expressed that they could be updated easily in the following years after developed once. For example, an instructor stated that "*After developed course material once, preparation time for the course in the following year is less than in the first year and also you can give the course more easily*. [I-4]"

Instructors tried to use self-study methods in their courses. They expected that participants did not learn course topics only from course web pages. They thought that online learner should be self-regulated learner. Also, they expected that participants asked, searched, and investigated course topics from all resources. In other words, they tried to teach them how to reach or find the information from anywhere when they needed. Therefore, they provided various resources that related to course topics. According to an instructor views about his course materials,

> *"Our course materials consist of basic information about course topics but we provide supported materials to the participants with help of reference books and online web pages, documents. Participants can access easily these supported materials and we recommend them read detailed information from these materials during the courses. Therefore, there is no need to prepare much detailed online courses. Also, participants can learn by exploring many resources.* [I-5]*"*

Instructors expressed the major points that students like and get difficulties in their course. According to them, participants generally were satisfied highly in the course when they used the course topics immediately. In other words, participants generally preferred practical information and they wanted to integrate their knowledge into their life immediately. An instructor of database course stated that *"Participants like generally design database, create tables, write queries in my course since participants feel that they can do something in the courses.* [I-6]*"* Therefore, instructors stated that they tried to provide more applications to the participants in the course notes, such as, examples, exercises, and assignments. On

the other hand, the major difficulties that student faced with in their course were studying theoretical and abstract course materials. These materials were not easily understandable by themselves. They could not grasp easily them by reading. Especially these topics were difficult for them if they saw at the first time. For instance, one instructor stated that *"It is difficult for the participants, especially novice participants, to grasp programming logic in my course.* [I-7]*"*

Instructors agreed that there were some deficiencies in the course structures and they could be improved. All instructors stated that they wanted to create a more effective learning environment with using contemporary techniques and tools. For example, some course topics, especially not easily comprehensible, could be designed with the help of rich materials (i.e. interactive examples, multimedia applications). If it was possible, video and sound could be integrated into their course notes and new technologies could be adapted to the course structure. Further, they thought that course notes were updated regularly, some of them were changed and more current topics and contents were added. In addition, two instructors mentioned that they should prepare more activities and applications, which help participants study themselves; therefore, participants could evaluate themselves and they could see their progress. Another instructor mentioned that various educational methods could be used to improve their courses; but, he needed help from educational technologists. Also, two instructors mentioned that course notes should consist of activities that help participants keep their motivation high to the courses. One the contrary, two instructors stated that these requests were not accomplished easily since one of them stated "*We need financial support and group of people who help instructors in designing and developing course materials.* [I-8]"

Moreover, instructors agreed that this program had a heavy curriculum. Eight courses were given in the limited time and course contents were not easy to learn immediately. Therefore, they stated that participants should study more compared to traditional one. An instructor mentioned about this program structures:

"We expect from participant as being successful as traditional student in our computer engineering department. Unlike in computer engineering department, eighth basic computer engineering courses are given to the participants in four semesters, lasting nine month totally in this online program. Each two course is given in consecutive two months. They are faced with new and more advanced course topic in the each following semesters. Some of the participants might not grasp all preceding course topics. Especially, it might be difficult for the participants who are not much self-disciplined. I think that online students should study more when compared to traditional one and study course topics regularly during entire program. [I-9]*"*

Institutional Support

Almost all instructors thought that their support to the participants with one instructor and one or two assistants was enough in their courses. They stated that they supported their participants whatever they could do in their courses. Also, they mentioned that there were enough learner support activities during the program. They could support the participants with instructional activities during their education in the program, such as, face to face meetings at the end of the semesters, interaction at the computer mediated communication tools (i.e. chat sessions, discussion lists), and exercises, assignments, exams. Similarly, one instructor stated that *"Our system is enough now. There is no problem in the courses in which one instructor and one assistant are dealing with all activities. We have not faced with students' requirements that we can not perform so far.* [I-10]*"* Moreover, the instructors thought that they did not know and follow much about participants' progress in online programs since online participants should be self-directed. Three instructors stated that participants should be active, ask for support and seek for help in this type of online programs.

Even though a general consensus about the support system in the program was enough, instructors thought that it could be improved. For example, they

mentioned that participants should be directed to be active in their learning process. Also, they interested in participants regularly in their courses. An instructor stated that they wanted to monitor their participants with more assistants in their courses; therefore, they could keep participants' motivation at a high level toward the course topics. Another instructor stated that "*We could frequently follow our students in the course. For example, we could evaluate our student by giving small parts of a project during the course instead of giving face-to-face exam at the end of the course*. [I-11]" Moreover, they stated that their technical structure might be revised to improve their learner support activities.

Flexibility

All instructors mentioned that online education brought many advantages and disadvantages to both students and instructors when compared to traditional one. The major advantages of online education were providing much flexibility while taking or giving courses. Participants could study whenever and wherever they desired and also they could arrange their time during their education. Similarly, instructors gave their courses at their home or works. On the contrary, online education could not provide face-to-face interaction, like traditional education, and instructors could not easily feel that the topics is understood with the help of seeing students' eyes during the courses and also they could not sure that their method or their speed was appropriate for all participants due to the lack of eye contact with them. As a summary, six of eighth instructors preferred the combination of online and traditional educational methods in their courses since both of them had strengthens and weaknesses. Only one instructor preferred online education due to its advantages and also only one instructor preferred traditional education due to its disadvantages.

Most of the instructors mentioned that participants were faced with some difficulties in the program due to the flexibility of online learning. Even though this program provided that participants could study whenever and wherever they desired, this flexibility caused for one of the major difficulties that student faced

with in the program were not studying the course materials regularly. Instructors expressed that some students did not study the courses and perform their requirements regularly and they might stay behind all topics. After some time, the subjects to be studied were accumulated; therefore, they might not catch the others and lose their motivation to the courses. These students might even drop the course before completing it, therefore, instructors emphasized that online learners should control their learning to be successful in online education.

Similarly, majority of instructors mentioned that they were also faced with some difficulties in the program due to the flexibility of online learning. For example, one of the instructors stated that *"We should follow various things to give successful education in our courses. For example, we have to follow messages sent in the discussion lists; we have to create productive discussion environments in the chat sessions; we have to use both synchronous and asynchronous tools at the same time; and so we have to guide students regularly until the end of courses.* [I-12]*"*

In addition, most of the instructors stated that they often dealt with synchronous interaction problems in their course. In this program, text-based IRC tool was used during chat sessions in the courses. This tool had some deficiencies. It needed fast keyboard skill properties to use properly and there were no audio and video opportunities. They could not control and guide more participants at the same time, therefore, instructors thought that advanced tool that support pedagogical and technical structures helped them prepare synchronous interaction effectively.

Online participants

The last theme from interview results with instructors was related to online participants. Instructors in the interviews mentioned online student characteristics in this online certificate program. They stated that online students were different from traditional students in several ways. Traditional students had similar

characteristics (i.e. similar age level, similar background knowledge) and their primary aim was to study and learn the courses topics. However, online students were older than traditional ones and they had various responsibilities (i.e. jobs, families) during their life. Also, online students had different properties among themselves. Their age range could be twenty to forty. Their background or educational could be from social or science field. Moreover, there were some differences in their motivations and aims to attend the program. For example, some online students attended this certificate program for finding a job, others attended for improving their knowledge about IT field.

Moreover, the instructors mentioned online satisfied and successful student based on their experiences in the online courses. According to them, learning in online environments occurs individually; therefore, students' characteristics were more important. They described students who were successful and satisfied as follows:

- These students were highly motivated to attend online courses and keep their motivation at a high level during entire education,
- They were mature enough. They were aware of their requirements and responsibilities and they were self-disciplined while doing their tasks,
- They could learn by themselves, they used self-regulated learning strategies, such as, self-evaluation, organization and transformation, goal setting and planning, monitoring, structuring their environments,
- They were active in their learning process. They followed the course notes regularly, studied and reviewed them carefully, and did their assignments timely. They could spent enough time for their learning or they could arrange their time for their education,
- They should be ready to take online courses. They felt that this education is different from traditional education. They took all responsibility of their learning in the course,
- They could not leave the course requirements easily and they could continue their education in spite of some difficulties,
- They could ask questions when faced with problems or they could know to ask for support when they needed,

- They could interact with peers and instructors regularly, and attended the discussions in computer mediated communication tools during the course,
- They were willing to learn and liked to learn. Also they liked to use computer and internet technologies in their education,
- They had prior knowledge about course topics and they interested in them before.

On the other hand, most of the instructors underlined that some students could not meet their course requirements. They did not follow the courses regularly, and they did not prepare assignments and pass the exams in the online course. Instructors mentioned about factors in a detailed way that affect student satisfaction and success negatively in the online courses. These factors could be combined into the two problems. First one was related to the motivation problems. For example, five instructors stated that some students were faced with motivation problems during the program and they could not keep their motivation at a high level in an entire course even though most of them started this online certificate program with a high motivation. There might be several reasons about decreasing motivation level. These reasons might result from the participants (i.e. family, health, job problems or lack of skills) and program (i.e. course schedule, lack of interaction). Second one was related to the adaptation problems. The instructors stated that some students could not adapt easily to this online program. Four instructors expressed that some student might underestimate time and effort necessary for online course. Students thought that they could achieve easily without studying hard in the course; however, it was not easy to be successful in the courses and students would have to study hard and regularly. Further, according to two instructors, students were not familiar with the way that they have taken courses so far. They mentioned that teacher-centered method is used as a widespread method in our education system from primary school to university. On the other hand, the instructors in this online program tried to use self-directed learning methods in their courses; therefore, this new learning model might be strange for some students during the program. Moreover, three instructors mentioned that some students could not be self-regulated learner. For example,

they suffered from lack of time management. They could not follow the courses and perform their requirements regularly since they sometimes might be faced with the problems related to their job, family or health in their life.

Moreover, most instructors thought that it has reached the main aims for eighth years and so this online program was successful, but, they also agreed that the program also could be improved. For example, they made some suggestions about guiding students in online learning environments. Online instructors believed that they should prepare instructional activities and instructional environments in which online students should be active in their learning process. Also, they should attend all interactions with other participants and instructors. Students should be encouraged to study course topics, ask their questions whenever they needed and see their learning progress. Giving timely and detailed individual feedback was the main issue for the effective learning in online learning environments.

Furthermore, they made some suggestions about program issues. For instance, two instructors stated that this is a certificate program, it is not a degree program; therefore, the credibility of the program might be increased. For this aim, one instructor mentioned that they could select some of the students among all applications, such as students who were familiar with program course topics and online learning. Another instructor expressed that this program rewarded the first three successful graduated participants by finding jobs or projects opportunities to motivate all participants in each year.

4.8 Summary of the Participants' and Instructors' Views

Interview results showed that there were five main themes based on participants' and instructors' views: interaction, course structure, institutional support, flexibility and online participants.

The participants and instructors thought that learning with interaction through CMC tools was one of the major benefits of online learning when it is compared

to learning from texts by themselves. They used these communication tools for various interaction purposes in this online program. According to them, asynchronous and synchronous communications were used complementarily to prove more beneficial in the online program since both of them have different weaknesses and strengths.

Almost all participants and instructors expressed that the interaction in the program, especially among the participants, was not enough in all semesters. Although the interaction among the participants was weak in the program, interview results showed that participants wanted to interact among themselves during the program; but, they were not much successful to increase interaction with other participants. In contrast to the level of interaction among participants, most participants agreed that they were satisfied with the interaction with the instructors in the program. According to the instructors, participants generally interacted with them about the requirements of the courses with which they had problems. They needed help from the instructors when they did not understand the course notes, exercises, and assignments.

The participants and the instructors mentioned that there were several reasons for the low level interaction, especially among the participants. The reasons of low level interaction included having different responsibilities and various occupations, lack of time, interacting only with participants with common background or preferring to study alone, not enough possible interaction in Internet-based education environments, progress of interaction over the Internet was taking more time, not having enough interactive activities in the program, not studying course topics regularly, having little knowledge about the topics, hesitancy about writing messages, and participants' dominancy in the discussions.

Instructors stated that the basic computer engineering courses in the program were selected properly and their topics were arranged from the beginner to the advanced level. Participants were satisfied with these courses materials, e.g. examples, exercises, homeworks, reference books. Although participants' thoughts

about the course structure were generally positive, their satisfaction decreased significantly over the semesters of the program, especially in the last two semesters. The interview results showed that there were some deficiencies in the courses that affected the participants' satisfaction level. The deficiencies were lack of visual elements and richness in the materials. Some complains were related to heavy and intensive curriculum. Furthermore, participants wanted more flexibility over the semesters, such as, providing some elective courses in the program.

In this program, the program coordinators and instructors tried to solve participants' problems when they arose. Participants were guided during the registrations and orientation program in this certificate program. Participants' opinions were gathered and appreciated at the end of the semesters of the program. Due to these activities, participants were generally satisfied with the institutional support. Although they were satisfied with institutional support, the results showed that some participants' desire more feedback while taking courses. They wanted to get individual and timely feedback about their progress and also participants suggested more synchronous activities and face-to-face sessions.

The participants and instructors in this study agreed that this Internet-based certificate program provided high flexibility to them. For example, participants could study whenever and wherever they wanted. On the other hand, participants' satisfaction about flexibility of the program decreased significantly in the program. Over the semesters of the program, participants realized that this program brought some difficulties to them, such as responsibility of learning is on students, lack of time to spare for the program due to other responsibilities, lack of flexibility in course selection and time of synchronous communication. These findings indicated that being ready and self-disciplined for such education were some of the characteristics that online students should possess. Additionally, flexibility in the course selection and time of the online communication should be the demands of the online learners.

4.9 The Participants' and Instructors' Participation to the Communication Tools in the Program

In this study, asynchronous and synchronous communication transcripts were examined to find out the level of participation to the online communication in the program. Two course instructors (one instructor, one research assistant) guided participants in the courses of this online program. Participants generally interacted with course assistants in the discussion lists and interacted with course instructors during the chat sessions and face-to-face courses. As a summary, the results showed that overall number of participation to both chat sessions and discussion lists was limited when it is compared to total number of participants in the program.

According to Table 4.8, there were more participation (participant participation and instructor participation) during the first semester in both CS and DL, the number of participation decreased during the second, third, and fourth semesters. Also, the number of participants decreased throughout the semesters due to the dropout problems. Another result was that the number of messages was higher in chat sessions than that was in discussion lists, but, the number of participants in the discussion lists was greater than that was in the chat sessions. In addition, the results showed that number of messages sent by instructors in discussion lists and chat sessions was more than that of participants in the second, third and fourth semesters.

Table 4.8 The participants' and instructors' participation to the communication tools in the program

	Semester-1		Semester-2		Semester-3		Semester-4		Overall	
	M	SD	M	SD	M	SD	M	SD	M	SD
# of attended participants in CS	17.5	6.0	7.1	3.6	5.6	0.7	5.9	2.1	9.0	3.1
Total # of messages sent by participants in CS	525	231.1	74.4	34	104	58,2	111	66.8	203.6	97.6
Total # of messages sent by instructors in CS	276	56.8	112	38.6	144	45	140	45	168	46.4
Total messages in CS	**804.8**	**247,9**	**186**	**38.2**	**248**	**97**	**251**	**89**	**372.5**	**118**
# of attended participants in DL	29	1.4	12	1.4	12	0.0	13.5	4.9	16.6	1.9
Total # of messages sent by participants in DL	174.5	0.7	37	1.4	38	9.8	76	35.3	81.36	11.8
# of messages sent by instructors in DL	112	7.07	47.5	12.0	43	28.2	65	7.1	66.86	13.6
Total messages in DL	**286.5**	**7.7**	**84.5**	**13.4**	**81**	**38.1**	**141**	**42.4**	**148.3**	**25.4**

CS: Chat Sessions, DL: Discussion Lists, M: Mean, SD: Standard Deviation

4.10 Summary of Results of the Study

As a summary, this study investigated several aspects of the satisfaction of participants enrolled in the online certificate program. The major factors that affected the participants' satisfaction and their changes over the semesters of the program and issues related to each factor were summarized in Table 4.9.

Table 4.9 The summary of findings about participants' satisfaction in the program

Factors affecting satisfaction	Changes in the factors over the semesters	Issues related to each factor
Interaction with peers	Increase (not significantly)	• participant's characteristics (i.e. lack of time, not studying course topics regularly) • internet's characteristics (i.e. progress of interaction over the Internet taking more time) • program's characteristics (i.e. not having enough interactive activities)
Interaction with instructors	Almost the same	• giving timely feedback • using both asynchronous and synchronous tools complementarily
Course structure	Decrease (significantly)	• designing course materials (i.e. examples, exercises, multimedia applications) • designing semesters and curriculum of program (i.e. numbers of courses, difficulties among semesters)
Institutional support	Almost the same	• designing institutional support activities (i.e. registrations and orientation program) • dealing with student problems regularly • individual feedback
Flexibility	Decrease (significantly)	• having self-regulated leaner skills • designing synchronous activities carefully

CHAPTER 5

DISCUSSIONS, CONCLUSIONS AND IMPLICATIONS

The findings of the study were presented in detail in the previous chapter under the title of results. In the light of the findings, a discussion of conclusions, summary, implications and recommendations for further research are presented in this chapter.

5.1 Overview

Student satisfaction has been the proper attention in distance learning environment like traditional learning environment in the last years. It is seen as an important measure of the key variables in determining the success or failure of distance learners, courses, and programs (Debourgh, 1999). Therefore, this study examined the factors (participants' perceptions, learner-learner interaction, learner-instructor interaction, course structure, institutional support, and flexibility) that contribute satisfaction of participants in an entire online certificate program. The sample consisted of the participants who enrolled to the program and the instructors who offered courses in this program in 2004-2005. Data was collected through both qualitative and quantitative methods. Online questionnaires were used to collect relevant data about participants' perceptions and participants' satisfaction in the program. Also, semi-structured interviews were conducted with both the participants and the instructors to analyze the factors that contribute to satisfaction in the program, and asynchronous and synchronous communication transcripts were examined to support the findings in the study.

In the previous chapter, the participants' perceptions of online technologies self-efficacy, online learning readiness, locus of control, and prior knowledge about ITCP courses and their correlation with satisfaction were analyzed. Also, descriptive statistics were reported upon the participants' satisfaction in regard to learner-learner interaction, learner-instructor interaction, course structure, institutional support, and flexibility. Multivariate and repeated measure analyses were utilized to examine the statistical data gathered by online questionnaires. The participants' and instructors' views were investigated, which generally revealed complementary results to the statistical results. In the following chapter, I will discuss all results of this study and the possible reasons for these results. At the end of the chapter, the implications and the recommendations for further research were declared.

5.2 Discussions and Conclusions

Throughout the past decade, advances in information technology have affected the various areas such as communication, nature of work, structure of organizations, daily life and also education. Especially, emerging technologies such as the World Wide Web and online communication tools have changed the face of education. These technologies create an anywhere and anytime learning environment allowing educators to deliver a course asynchronously, synchronously or a combination of the two. Also, these benefits provide easier and more convenient access for many students who were unable to attend traditional classes. With the help of these technologies, higher education institutions start to offer a number of distance education opportunities to meet the needs of increasingly high numbers of these nontraditional students (Khan, 1997; Kearsley, 2000).

As distance education, especially online education, continues to expand, educators find the need to understand online students more in online learning environments. Students who participate in distance education are different from traditional students. Demographic data available from several studies about online students showed that the majority of them are female, married, employed full or part time,

and older than typical traditional students (Thompson, 1998). Many of these students have other responsibilities outside of school (e.g., family, job) that place constraints on their time and their commitment to school (Moore & Kearsley, 2005). Furthermore, according to Knowles's andragogy theory, "adult learners take control of their education, and want the opportunity to learn at their own pace, at times and places compatible with the commitments of family, work and leisure. Also, they demand relevant and applicable coursework and a learning environment that is supportive and collaborative." (Knowles, 1984, p.125).

Similarly, the demographic information of students and instructors' views in this study showed that the students of the online course came with different educational backgrounds, age levels, learning styles, employment characteristics and also many of these students had other responsibilities outside of school (e.g., family, job) in this online certificate program. There are a number of research studies showing what motivates these online students to be involved in continuous formal education. Houle (1961) conducted a qualitative study from which he identified three types of adult learners. One of them was goal-oriented who pursued education in order to accomplish a definite objective. Another one was learning-oriented who pursued knowledge for its own sake. The last one was activity-oriented who pursued learning with no necessary connection to the stated purpose of the activity. The results in this study showed that most of the participants expected to get knowledge about information technology or to renew their knowledge about information technology with attending this online certificate program. Also, some of them anticipated to be productive in their present jobs and to make progress in their existing careers as a result of online ITCP. Therefore, the results showed that the participants of this study were mainly learning and goal oriented participants, like other participants who registered to the programs from 1998 to 2003 (Yukselturk & Yildirim, 2004). As a result, it can be stated that the factors that affect the participants in choosing online ITCP were parallel to the major aim of the online ITCP. In addition, distance education programs, like online ITCP, might reexamine the learning environments and courses of the program regularly to find out whether these learning and goal

oriented adult learners can accomplish their goals and they can acquire interesting and relevant knowledge and skills.

Participants' Perceptions of Online Technologies Self-efficacy, Online Learning Readiness, Locus of Control, and Prior Knowledge

Online courses and programs are generally being designed to meet the need nontraditional or online students. Research showed that these online students are different from traditional students and their perceptions are quite different from what they experience, and there might be some misconceptions of students before attending online courses and programs (Howland & Moore, 2002). Therefore, student perceptions might affect their satisfaction and success in the online courses. Due to this fact, the nature of the relationship between participants' perceived self-efficacy in online technologies, online learning readiness, locus of control, prior knowledge about online ITCP courses and participants' satisfaction in online certificate program was analyzed in this study.

The literature indicated that students' some perceptions had a statistically significant relationship with satisfaction and learning outcomes in an online environment (Bandura, 1986; Biner, et. al, 1996; Eastmond 1994; Lim, 2001). The results of this study paralleled to the previous studies. Participants' perceptions of online learning readiness correlated statistically significant with participants' satisfaction. Warner et al. (1998) defined the concept of readiness for online learning in terms of three main aspects: (a) students' preferences for form of online instruction as opposed to face-to-face classroom instruction; (b) student confidence in using electronic communication for learning and, in particular, competence and confidence in the use of Internet and computer-mediated communication; and (c) ability to engage in autonomous learning. This study mainly analyzed two factors of online learning readiness, comfort with e-learning and self-management of e-learning (Smith, Murphy & Mahoney, 2003). According to the descriptive statistics of this study on participants' perception of

online learning readiness, participants perceived themselves ready for online learning.

The regression analysis of this study showed that online learning readiness was the predictive perception that enter regression equation and accounted for about 9.2 % of the variance in participant satisfaction. Similarly, some previous studies found that participant readiness is an important prerequisite to satisfaction (Eastmond 1994; Gunawardena & Duphorne, 2001; Kuchinke, Aragon, & Bartlett, 2001). For instance, Gunawardena and Duphorne (2001) stated that learners who felt more positively about their readiness to participate in an academic computer conference were more satisfied with the conference. Kuchinke, Aragon, and Bartlett (2001) suggested that participant satisfaction in online courses partially depends upon various readiness factors, including self-directed learning and technical preparedness for the online environment. These results confirmed that online learning might not be for everyone and students need to consider the differences between face-to-face and online learning. Before students enroll in online courses, they should consider some major issues and and then decide to whether attend the online courses. These major issues might generally related to the comfort with e-learning technology and self-management of e-learning. Also, these major issues were mentioned and described by the course instructors in the interview results.

These results also showed that online administrators and instructors should help and support their learners not only during taking online courses but also before taking online courses. Learners could be introduced to the requisite skills and experiences prior to participating in the online environments. In this online ITCP, only participants who are students or who graduated from 2 or 4 year university programs have been accepted to the programs. Other expected characteristics of participants to be enrolled in the program are being computer literate, accessing a computer which has Internet connection and multimedia properties, intermediate level of English, attending face to face courses and examinations, which will be held at METU campus for two days in each eight-week semester, and sparing at

least 6 hours for each course in a week. As a result, online participants had to be at least undergraduate students in the universities or university graduates in this online program. Therefore, online learners should be older or become mature enough to attend the online program. Furthermore, participants were guided by during the registrations and the face-to-face orientation was organized to explain the program and courses to the participants, help them meet each other and with the instructors, explain how to use the web pages and how to study the courses online at the beginning of this online program. With the help of these activities, participants were prepared to be ready for online learning.

Even though other three variables (participants' perceptions of online technologies self-efficacy, locus of control and prior knowledge) did not enter the regression equation of predicting satisfaction in this study, these variables were important predictive variables for student satisfaction in some previous studies (Bandura, 1986; Lim, 2001; Parker, 1999; Wang & Newlin, 2000). According to the descriptive statistics of this study, the participants perceived stronger self-efficacy in online technologies at the beginning of this online program. Bandura (1986) described self-efficacy as individuals' confidence in their ability to control their thoughts, feelings, and actions, and therefore influence an outcome. In distance education, computer-mediated communication technologies, such as e-mail, bulletin boards, newsgroups, video conferencing have become the primary modes of interaction, communication and exchange of information between students and instructors. Therefore, several studies have been conducted on the self-efficacy of students toward distance education or the technology used in online learning (Joo et al., 2000; Lynch & Dembo 2004; Wang & Newlin, 2002). Wang and Newlin (2002) found that self-efficacy beliefs for understanding course content and possessing the technological skills required for successful completion of an online course were statistically significant. Joo et al. (2000) also indicated that Internet self-efficacy was an important variable in online student success. In this online ITCP, participants were assumed that they feel confident with online technologies at the beginning of the program, especially about internet competencies, asynchronous interactions involving electronic mail and electronic

bulletin boards since the subjects and courses of this online program are related to computer engineering and most participants already are interested in this field. In the interviews, participants did not mention any difficulty in using communication tools in the program. As a result, participants' perceptions of online technologies self-efficacy were generally positive at the beginning of the program and correlated significantly with online learning readiness, internal locus of control and prior knowledge in this study.

Moreover, participants had mainly internal locus of control in this study at the beginning of this online program and did not enter the regression equation of predicting satisfaction. According to Rotter (1966), there are two types of locus of control: internal and external. Individuals who have an internal locus of control will take responsibility themselves for failures and congratulate themselves for success. Individuals who have an external locus of control tend to see their failures and successes as a result of chance, luck or intervention by others. Research generally showed that students with an internal locus of control are more likely to be successful or satisfied than students with an external locus of control in the distance education environment (Parker, 1999; Stone, 1992; Dille & Mezak, 1991). In this study, participants were willing and voluntary to attend the courses of program. Most participants enrolled to this program, paid fee of the program and took the responsibilities themselves. These could affect the program's flow in the positive way even though they were not measured.

This study results also showed that participants generally did not have much prior knowledge about program courses before attending this online certificate program. In the literature, prior knowledge is simply defined as the knowledge, skills, or ability that students bring to the learning process (Jonassen & Grabowski, 1993). Wang and Newlin (2000) found that the backgrounds of online learners could provide early warning indicators for failure or success in online education courses. The descriptive results and interview results showed that participants were interested in computer enginnering topics, but, their knowledge level was not the same at the beginning of the program in this study. Some of

them were familiar with courses, but, most of them did not have much detailed information about the courses academically. Therefore, a problem stated by some participants was the increased difficulty level of the courses from one semester to the next in the results of the study. Also, one complaint was related to heavy and intensive curriculum in the program. As a result, participants' prior knowledge might be tested in detail at the beginning of this program or similar program. If there are enormous differences in parpaticipants' prior knowledge, participants might be divided into two or three different groups based on their knowledge level. Another way is that special instructional support activities might be designed for the participants having low level knowledge about courses during the program.

In addition to the statistical results in this study, instructors described online successful and satisfied students that related to generally self-regulated learner characteristics in the interview results. For example, they stated that students should be mature enough to know what they want in the online courses. Also, online students should be aware of their responsibilities and they could control their learning with being self-disciplined. Interview results also showed that the successful and satisfied students were active in their learning process. They followed the course notes and reviewed them regularly, and accomplished their duties carefully. While doing these requirements, interaction with peers and instructors played an important role in ensuring their success in this online program. In the literature, research stated that one of the best predictors of academic success appear to be self-regulation and its strategies in educational environments (Zimmerman & Martinez-Pons, 1990; Pintrich & De Groot, 1990; Schunk & Zimmerman, 1998). Similar to instructors' view, these students are described with having three main characteristics in the literature (Pintrich, 1995). First, self-regulated students try to control their behavior, motivation, and thought. Second, these students aim to accomplish a goal. Lastly, they must be in control of their learning. Zimmerman and Martinez-Pons (1990) also stated that self-regulated learners select, organize, create advantageous learning environments for themselves and plan and control the form and amount of their own instruction for

their academic achievement. Although students can become a self-directed learner without explicit instruction, it is more likely to occur when instructors and administrators understand and foster them during education (Lumsden, 1999; Renchler, 1992). Instructors, administrators, and students must understand the concepts of student motivation, metacognition, self-efficacy, self-regulation, locus of control, and goal orientation. These concepts provide the foundation for a student seeking to become a self-directed learner (Zimmerman, 2002).

Some of the features that help foster self-directed learners and learning, as instructors tried to foster participants in the online ITCP, are as follows (NREL, 2004): (1) Instructors raise awareness of students' role in their own learning and shift some of the responsibility for learning from themselves to the learner. In this program, instructors mentioned often students' role in the courses at the beginning orientation program and face-to-face courses at the end of each semester; (2) Instructors encourage study skills, inquiry, questioning, and an atmosphere where errors are acceptable during the process of arriving at correct answers. In this program, the interview results showed that instructors tried to create positive social environments in the CMC tools, and both task and social oriented messages were encouraged to post to these tools; (3) Instructors provide opportunities for students to self-monitor, revise work, and reflect on their own thinking and learning processes. In the program, there was some deficiencies for this feature, especially in assignments and exam evaluations; (4) The courses have problem-based and project-based learning activities. Students have opportunities to explore solutions to real-world problems and focus on innovation. Students also have opportunities to transfer conceptual knowledge to new situations. In the program, only one course was designed based on project-based learning activities. These activities might be increased in other courses of the program; (5) Collaboration and cooperation should be high in the online courses. In this program, online discussion lists and chat sessions were used to increase interaction among learners and instructors, but, a variety of pedagogical strategies need to be employed to overcome low level interaction; (6) Instructors reward achievement, perseverance,

risk taking, and collaboration. In the program, successful participants were rewarded with giving presents at the end of the program.

Unfortunately, all students might not be successful in online environment, like in traditional educational environments. They might not accomplish the course requirements and fail in the course. The interview results showed that there were several reasons that might affect being unsuccessful and unsatisfied. One of them was that student might underestimate time and effort necessary for online courses. They thought that they could achieve easily without studying hard in the course. On the other hand, students had to study more in online programs (Moore & Kearsley, 2005). In addition, some students could not arrange their time properly in the online course. Research showed that time planning and management training helped students to better self-regulate their use of study time and improved their achievement (Zimmerman, Greenberg, & Weinstein, 1994). Another aspect of reasons was related to unexpected emergency situations in students' life. Online students have various responsibilities apart from attending online courses. They sometimes might be faced with the problems related to their job, family or health in their life. These interview results were parallel to the statistical results that participants' perceptions of online learning readiness correlated statistically significant to the participants' satisfaction. As a result, this online program should provide more orientations and guidelines for time management and how to handle the course when they had personal problems.

Interview results also showed that some students, especially unsuccessful and unsatisfied ones, were faced with motivation and adaptation problems in the online courses. Students started online certificate program with having a high motivation, but, instructors mentioned about decreasing students' motivational level over time in the online courses. In other words, students could not maintain their motivation during the entire course; therefore, they might fail in the course. According to the interview results, the reasons of decreasing participants' motivation in the program might include absence of a physical classroom, nature of online learning, lack of self-directed learning skills, lack of interaction among

participants and instructors. Actually, most adult learners are already motivated, the challenge is to improve and sustain motivation in online environments. According to the studies conducted on motivation in distance education, motivation has a great importance in student success and continuity (Keller, 1999; Sankaran & Bui, 2001; Song, 2000). Also, Pintrich and De Groot (1990) stated that students should not only use self-regulated learning strategies to promote achievement but also they should be motivated to use these strategies to carry out course requirements. Therefore, more focuses on designing and developing motivating components should be given in the program courses. Keller (1999) stated the motivational elements of instruction as encompassing four necessary components: engaging and maintaining student interests, relating course content to student interests, enhancing student confidence in understanding course content, and satisfying students' inquisitiveness related to information thus encouraging students' active involvement in learning. These elements were summarized as attention, relevance, confidence, and satisfaction in order to create the ARCS model of motivation. Paralel to Keller's model, Hofman (2003) stated some suggestions about motivating online learners while designing the online courses and interacting with online learners: publish requirements and set expectations ahead of time; establish relevance; provide continuous encouragement; use assessments; get supervisor and peer support; make learning a management mandate; offer rewards and recognition; publicize success stories; and ensure personal success in the online courses.

According to the results, another problem was that some student could not adapt to the online program easily since they generally have received information passively from teachers in traditional class. On the contrary, online learning environment requires the students to be active and use self-study methods to be successful in the courses. Hill and Hannafin (1997) emphasized this problem and they stated that traditional education does not prepare students for the exploration and learner-centered thinking that is necessary in online learning environment since students are largely externally managed and teacher-directed in traditional class.

Consequently, the findings suggested that online administrators and instructors at higher education should be aware of issues associated with the level of student satisfaction with regards to students' perceptions, especially online learning readiness, self-regulated learning skills and motivation, and address these issues when planning, developing and administering online courses.

Participants' Satisfaction

Learner's satisfaction of online learning is regarded as positive in the literature (i.e. Allen & Seaman, 2004). A meta-analysis about studies of comparison between distance education and traditional methods showed that students find distance education as satisfactory as traditional classroom (see Allen, Bourhis, Burrell, and Mabry, 2002). In this study, the participants' satisfaction with online learning was generally positive; it decreased over the semesters of the program. The major factors investigated in this study were interaction with instructors and peers, course structure, institutional support, and flexibility that affected satisfaction in online learning.

Interaction has been recognized as one of the most important components of learning experiences both in traditional education and in distance education (Moore, 1989). Computer mediated communication tools have great potential for designing interaction in online environments. Asynchronous (e.g. discussion list, e-mail) and synchronous (e.g. chat sessions) communication tools were used mainly for interaction among participants, and between participants and instructors in this online certificate program. With e-mail, participants could discuss special problems, with discussion list, participants could discuss any topic or ask any question anytime, and with chat sessions, participants could discuss course topic asking questions and getting immediate answers in real time. The findings of this study indicated that asynchronous and synchronous communications should be used complementarily to prove more beneficial to online learning due to their non-overlapping weaknesses and strengths. As a

summary, participants and instructors felt that interaction in communication tools was a major benefit of online learning.

Interaction among learners through communication tools seems to be one of the most influential features of online courses (Swan, 2001). *Learner-learner interactions* seeks to encourage learners to work together to share information and opinions, analyze data, and solve problems (Hirumi, 2002). Although interaction among learners increased slightly over the semesters of the program, instructors and participants thought that it was not strong enough. The lowest mean score factors affecting satisfaction was related to learner-learner interaction in the program. Participation in asynchronous and synchronous communication tools supported these results. Phillips and Peters (1999) stated that lack of interaction causes lack of attentiveness and lower satisfaction level with the learning experience. Due to lack of interaction, a feeling of isolation comes out as one of the most crucial problems in online learning environments (Harasim, Hiltz, Teles & Turoff, 1995). This problem (isolation) could also result in negative attitudes and overall dissatisfaction with the learning experience (Daugherty & Funke, 1998).

The results demonstrated that there were number of reasons for low level interaction in the program. The reasons of low level interaction included having different responsibilities and various occupations, lack of time, interacting only with participants with common background or preferring to study alone, not enough possible interaction in Internet-based education environments, progress of interaction over the Internet was taking more time, not having enough interactive activities in the program, not studying course topics regularly, having little knowledge about the topics, hesitancy about writing messages, and participants' dominancy in the discussions. As a result, several factors might hinder interaction among participants and participants with the instructors in the online programs. Over the semesters of the program, these factors increased and interaction could not reach expected level in this study. Thus, the lack of interaction while learning in this online environment resulted in the low levels of satisfaction.

The issues related to the reasons of low level interaction were also stated by several studies in the literature. (i.e. Dennen, 2005; Hara & Kling, 1999; Northrup, 2001; Wiesenburg & Hutton, 1996). Hara and Kling (1999) stated that online students working alone at different times and in different locations may not interact much due to the lack of visual and physical interactions with the other students. According to Wiesenburg and Hutton (1996), students identified the amount of time involved in learning online and the need to be self-directed learners. Also, Northrup (2001) stated that "Interaction doesn't just happen. It must be designed intentionally into web-based courses" (p. 33). Learner-learner interaction in this online ITCP was facilitated through asynchronous online discussion groups, e-mail, group projects and sysnchronous chat sessions in the courses. The primary way to increase interaction in thees tools requires participation since there was not enough in this program. Therefore, online communication and interaction activities might be designed based on participants' requirements. To increase pariticipation, the discussion in the online tools should be more structed. Instructors or moderators should make it interesting. Also, the discussion can be leaded by the students and they can form small groups or learning teams during the discussion.

In addition, learner satisfaction is highly correlated with the performance of the instructors, especially with their availability and response time (DeBourgh, 1999). The results showed that participants were generally satisfied with the *interaction with their instructors* in all semesters of the program. They were pleased for the effort of the instructors, and they could reach them easily. When the participants needed, they asked for help especially about course requirements, examples, exercises, and assignments from the instructors. All instructors tried to help them in a short time during the program. Participants generally used course discussion lists, chat sessions and face-to-face meetings to contact with the course instructors. In the course discussion list, course assistants helped them by answering their questions and in the face-to-face classes and chat sessions course instructors explained the unclear topics of the course in a detailed way. Also,

almost all participants were satisfied with the face-to-face classes to understand course notes profoundly; therefore, some of them required more face-to-face interactions and chat sessions. As a result, the key element for effective learner-instructor interaction is support. They are responsive and provide timely feedback, serve as a mentor, guide and facilitator, and create an interactive learning environment in the online courses.

Participants' thoughts about the *course structure* were generally positive in the program, especially at the beginnings. According to them, the courses in the program were selected properly and their topics were arranged from the beginner to the advanced level. Also, they were satisfied with the materials of courses, e.g. examples, exercises, assignments, reference books. Also, all instructors agreed that designing and giving online courses properly was not easy job for them since online education placed all major responsibilities on the students; therefore, they tried to create a more effective learning environment. In this study, participants' thoughts about the course structure were generally positive, but, their satisfaction decreased significantly over the semesters of the program, especially in the last two semesters.

The interview results showed that there were some deficiencies in the courses that affected the participants' satisfaction level in the program. For example, the major complaints were related to the content of the courses. Some courses consisted of: (1) too much general information, limited examples and exercises, (2) too much conceptual information, limited practicable examples, (3) spelling and grammar problems. Because of the lack of physical interaction imposed by the web–based learning environment, course notes and information made available to the student must be clear, detailed, and of high quality for comprehension (Furnell, Evans, Phippen, & Abu-Rgheff, 1999; Graham, Cagiltay, Craner, Lim & Duffy, 2000). Other participants' complains were related to curriculum as well. It was too heavy and intensive for nine months and participants needed more time to carry out the requirements in some courses. Instructors also agreed that this program had a heavy program. It needed more work compared to traditional ones.

Course structure and design appeared to be some of the key elements that affected student satisfaction along interaction. The results showed that even though some courses in the program were designed sufficiently, the structure of the whole program and design of the courses needed more attention. There was no one strategy for all courses and different strategies might be used for each course and semester (Northrup, 2001). Following are specific instructional methods that can be used in online courses: self-directed learning, lecture, discussion, small groups, mentoring, projects, learning contracts, collaborative learning, and case studies. In this program, a project-based learning approach might be used in several courses, especially related to programming language courses. Projects allow students to have practical experience with a concept and give a sense of accomplishment. These projects can be individual or group and shared with other participants and groups. Also, in some courses, case studies can be presented on web pages and discussed together in the communication tools. An appropriate cases can be selected based on the interests and experience level of participants and to the concepts being taught. As a summary, McPherson & Nunes (2004) indicated educators and designers must interact and invest more time and effort on the analysis of learners, content, context, application, technologies, and curriculum to design for an effective online courses and programs.

Distance educators seem to have a clear understanding of the need for *institutional support* services. Rumble (2000) summarized some distance education student support research: learners without support delay program completion; contact between students and institution is beneficial; and advice given during enrollment affects later performance. In this program, the program coordinators and instructors tried to solve participants' problems. Also, participants were guided during the registrations and orientation program in this certificate program. Moreover, participants' opinions were gathered and appreciated at the end of the semesters of the program. Due to these activities, participants were generally satisfied with the institutional support. Also, instructors expressed that there were enough learner support activities, especially technical and administrative support,

during the program. However, they could support more the participants with instructional activities during their education in the program.

Although participants were satisfied with institutional support, the results showed that some participants' desire more feedback while taking courses. They wanted to get individual and timely feedback about their progress. Thurmond et al. (2002) stated that instructors teaching online courses need to carefully plan their schedules for student assessment and feedback activities since timely feedback from instructor contributed significantly to students' satisfaction. In line with this statement, the participants suggested more synchronous activities and face-to-face sessions. Also, they wanted to get more feedback about assignments, projects and exams results. In the interview results, to improve support systems, instructors stated that they needed more people to provide participants support more in online courses. Therefore, the program might need instructional support group that help participants and especially instructors in the courses and so the workload of instructors might be diminished in the program.

The participants and instructors in this study agreed that this Internet-based certificate program provided high *flexibility* to them. In this study, the flexibility is simply defined that able to work at the time, place and pace that the student chooses; accessibility, convenience, freedom and blending delivery approaches to provide a variety of learning outcomes and pathways. Especially, at the beginning participants thought that the flexibility of this online program was essential advantage for them and they were satisfied with it. However, over the semesters of the program, participants realized that this program was not flexible enough for them. It has four semesters, two courses were given in each semester, it lasted two months, at the end of the semester participants had to come campus of university and attend the face to face courses and exams. The structure of the semesters and courses was not changed until the end of the program. Also, predetermined online discussions in the courses were always not suitable for all of the students. Participants generally had to follow the structure of the program and they had to study more to be successful in the program. As a result, the findings showed that

this program brought some difficulties to them, such as having all responsibility of their learning, lack of time to spend for the program due to other responsibilities, lack of flexibility in course selection and unsuitable time of synchronous communication in the program.

Most adult and online learners liked the convenience that the online learning delivery format provided. They appreciated being able to learn where and when they wanted to and at their own pace. The flexibility of online learning allowed learners to schedule their learning around their duties. It is known that these features of e-learning make it such an attractive medium through which to learn. The results showed that one of the problems about flexibility was related to being ready and self-disciplined for such education. These results emphasized again the importance of responsibilities of online learners. Also, another problem was related to desing the programs properly. According to the results, the online program components might be designed and updated based on learners' desires regularly in the program. Especially, the flexibility in the course selection and time of the synchronous communication should be the demands of the online learners. Also, participants could follow the courses that they want at their own pace. They could study at times that best suit time. Furthermore, students could be provided with more flexibility in the selection of assessment options in the courses. Otherwise, the online program provide flexibility to the learners only about the place. As more students seek flexibility in their courses, it seems inevitable that the online program should provide more options that they can select suitable one.

As a conclusion, the success of any program like online programs generally is attributed to the satisfaction of the student. Literature analyzed a number of factors to get high levels of learner satisfaction for preparing more effective online programs. Similarly, this study investigated several aspects of the satisfaction of participants enrolled in the online certificate program. The major factors that affected the participants' satisfaction were interaction with instructors and peers, course structure, institutional support, and flexibility. Although the participants'

overall satisfaction was generally positive, it decreased over the semesters of the program. Participants were satisfied with the learner-instructor interaction and institutional support in the program. However, participants' satisfaction level was low for interaction among the participants. Also, participants' satisfaction about the course structure and flexibility decreased over the semesters in the program. As a summary, the findings from this study might provide valuable information about the nature of online students' satisfaction. Although the sample of this study was small, which was a major limitation of the study, the results may also help institutions of higher education consider potential factors that affected students' satisfaction in entire online programs.

5.3 Implications

Student satisfaction has been given high attention in distance learning environment like in traditional learning environment. There are number of reasons for the attention given to learners' satisfaction in online courses. First of all, understanding the factors that affect the student satisfaction such as interaction with instructors and peers, course structure, institutional support, and flexibility will help course organizers and teachers take the necessary measures to increase satisfaction. Second, it is seen as an important measure of program outcomes and program quality. Third, satisfaction is influenced a lot by contextual factors, making it necessary to analyze online learning within its own context. Therefore, this study was to investigate satisfaction of participants enrolled in the Online Information Technologies Certificate Program (ITCP)

The Online ITCP is one of the first Internet- based education programs in Turkey. This program was started in 1998 and it is still offering certificate to the participants. It has been updating course materials, web pages, and changing courses, instructors, and its curriculum from beginning of the program. With this study, the results contributed to better understanding of the factors that affect the student satisfaction in the entire online certificate program. Consequently, the

results of this study are valuable for the improvement of online ITCP and similar online programs.

The participants' demographic characteristics demonstrated that online students were very heterogeneous in this online study. Participants' characteristics showed differences in terms of especially age, education levels, faculties graduated from or currently studied at and also perceptions. The previous studies also showed that student perceptions might affect satisfaction in online environments (i.e. Biner, et. al, 1996; Lim, 2001; Gunawardena & Duphorne 2001; Wang & Newlin 2000). Similarly, the results of the study indicated that participants' perception of online learning readiness was one of the important factors that affect participant satisfaction in the online certificate program. Participants' perception of online readiness correlated statistically significant with participants' satisfaction. As a designer or instructor in online programs, we should prepare students before attending online learning. For instance, orientation to give information about the nature of online learning and its requirements should be provided to the students to better understand and determine whether they can handle the requirements in the independent environment. Also, they should be guided to adapt to learning environments and learning methods (i.e. the student-centered methods) and they could be educated how to learn and study in the online courses.

This study and distance education literature confirmed that online learners are different from traditional ones. Also, their responsibilities are different from others. These new characteristics and responsibilities of students, especially successful and satisfied ones, were important in order to develop high quality online program. Here are some of the important study habits and personality traits of successful and satisfied online students that also mentioned in this study: be self-motivated and self-disciplined; take responsibility for the learning process; create a schedule for yourself and meet the deadlines; be willing to learn independently and in groups; be willing to speak up if problems arise; contact the instructors and peers promptly with questions about any aspect of the course; have basic computer skills, access to a computer and a modem; become familiar with

the online environment and be able to communicate through writing. As a result, these online students should have self-regulated learners' characteristics.

In the literature, Zimmerman (1986) explained that self-regulated learners are students who are "...metacognitively, motivationally, and behaviorally active participants in their own learning process." And also he stated that "self-regulated learners perceive themselves as competent, self-efficacious, and autonomous" and "self-regulated learners select, structure and create environments that optimize learning." (p. 309). As a summary, not all students are good candidates for online learning. Some students might not tend to be succesful in online courses. These findings suggested that people who deal with online courses and programs (i.e. administrators, chairpersons, deans and instructors) might be aware of issues associated with the level of learner satisfaction and success with regards to learner characteristics. The findings of this study might help them orient students to the kind of skills they will need to function well in the online environment. It could also assist them in setting realistic criteria for determining who should be admitted to an online course. Students without the characteristics or skills that enhance satisfaction might be avoided taking online courses before being ready or might be provided special attention in the online courses by the instructors or administrators.

In addition to students' characteristics and responsibilities, instructors' role also changes in the online courses. The findings suggested that the instructor as a facilitator plays an important role in developing and maintaining an online program. The facilitator is also the designer and monitor of the online course. This role is even more critical, as the instructors has to overcome potential barriers caused by technology, time, and place and create an optimal environment for achieving educational goals. Students' performance should be monitored with the help of individual and timely feedback from online instructor during the online course. Also, learners should be encouraged to keep their motivation at a high level with the help of instructional activities designed by online instructor during the online course. Burge (1994) stated that instructors should support by "giving

fast and relevant technical help, sending timely and individualized content-related messages and feedback, with, if possible, summaries of discussion and guidance about resources, and offering affective support (welcome, encourage, show empathy, role model support-giving)" (p. 30-31).

The literature confirmed that we need satisfied students with their courses and programs to have lower attrition rates, increase in enrollments, prepare good quality of learning environment (i.e. Biner, Dean, & Mellinger, 1994; Bolliger, 2001; Schwitzer, Ancis, & Brown, 2001). In this study, participant satisfaction was decreasing significantly toward the final semesters of the program even though participants' overall satisfaction was generally positive. Participants were satisfied with the learner-instructor interaction and institutional support in the program. However, participants' satisfaction level was not enough for interaction among the participants. Also, participants' satisfaction about the course structure and flexibility were decreasing significantly over the semesters in the program. At most basic level, this study proved that online courses or programs should be designed by taking into consideration of all factors (i.e. interaction, support, course structure and flexibility) to see satisfied students in the online programs.

To increase participant satisfaction, especially learner-learner interaction were the most important factor in distance learning as mentioned in detail in the literature review chapter. Some importance issues in designing online interaction among participants were emphasized based on the results of this study. First, participants should be encouraged participation in discussion lists and chat sessions through a variety of methods including posting of course announcements, group e-mails, individual e-mails, and telephones (Hara, Bonk, & Angeli, 2000). Second, social environments could be created for open communication where participants feel comfortable posting questions or comments relatives to content, assignments, projects and also social exchanges (Yukselturk & Top, 2006). Third, the courses should be designed with a voluntary or a required discussion groups as stated by the course expectations. Fourth, learning and instructional activities, projects, reports should be designed to perform collaborative learning. Fifth, especially

synchronous sessions should be designed according to the participants' desire, such as in a suitable time and participants' levels of knowledge. Sixth, the quality of discussion postings by participants might affect grading at the end of course.

In this study, participants were satisfied with the learner-instructor interaction and institutional support in the program. They were pleased for the effort of the instructors and administrators. To satisfy participants, students should receive timely feedback or instructors tried to help them in a short time during the courses (Thurmond et al., 2002). Asynchronous and synchronous communications were used complementarily to prove more benefit in the courses. Blended learning principles which combine face-to-face traditional learning and online learning methods might be used in the online program. Also, participants were guided in a detailed ways during the registrations and orientation program and participants' opinions were gathered and appreciated regularly during all program. As a retention strategy, inactive students might be contacted via e-mail or phone to discuss course expectations and students goals.

In addition to interaction in the program, the results indicated that there were some problems in the courses of the online program. Participants stated that the topics of courses were too compact, the semesters in the program were too short, the flow of courses was very fast and the topics of some course notes were disorganized and too hard. Also, the courses consisted of too much general information and the content, examples, and exercises were not sufficient to understand the topics. Therefore, the results emphasized the importance of some issues in designing online course. First, clear learning objectives can be developed for the courses content, activities and assessments. Second, comprehensive course syllabus should contain the following: (1) course description, (2) identification of textbook and or supplemental learning materials, (3) calendar of learning activities and due dates, including assignments and online discussion requirements, (4) instructor contact information, (5) grading criteria for each learning activity, (6) attendance policy specific to course participation, (7) prerequisites to course (Graham, Cagiltay, Craner, Lim & Duffy, 2000). Third,

courses should be developed beyond text and exploit instructional media and interactivity to include suggested activities, such as, web searching, graphics, self-assessments, PowerPoint presentations, interactive learning games, learning objects, audio and video clips. Fourth, courses engage students in application activities and encourage active learning through a variety of suggested methods, such as, problem-based learning, project-based learning, case studies, online discussions and debates.

Online education provides several advantages to both students and instructors. The major advantage is greater flexibility of both class time and space. In this study, participant satisfaction about flexibility was decreasing significantly toward the final semesters of the program. These results showed that flexibility is certainly one of the biggest advantages of online learning, but it can also lead to potential problems. While students could access and work on their instructional materials and assignments at their convenience, they need necessary skills to success in online learning environment. Also, it is important for today's online instructors to have a clear understanding of their role in the online teaching and learning process to give their courses effectively. In addition, online programs should meet most learners' desires. They provide several options that learners can select suitable one for their learning process. These options are related to learn when they want (timing, duration), how they learn (modes of learning), and what they want (that is learners can define what constitutes learning to them).

As a summary, there are many research studies done on only one delivery method in distance learning, and emphasize on student outcomes for individual courses rather than for total academic programs. The results of this study provided valuable information to the literature about both asynchronous and synchronous delivery methods and this study was prepared to examine the total of online certificate program. Therefore, the results of this study contributed to literature in this field as the investigation of the whole program. Additionally, earlier studies generally examined participants' perception, participants' satisfaction and the factors that affect them only one time at the beginning or at the end of course.

However, these factors may fluctuate during the period of time. This study analyzed entire program in order to avoid the pitfall of a one-shot measure of these factors and provide a better understanding of relationships among these factors in the long period of time.

Guidelines for Online Programs

Learner satisfaction is one of the major components in ensuring learning outcome and determining the effectiveness of learning in online environment. In the light of the findings of this study, the following recommendations are made in developing and conducting online programs. Eventhough the findings of this study cannot be generalized beyond the case examined in this study, the recommendations made below can provide valuable information for the designers and instructors of online programs.

Guidelines for interaction in the online programs:

- Each online course in the programs should have separate e-mail, discussion list, and chat sessions. In other words, both of asynchronous and synchronous communication tools should be used complementarily in online learning environment.
- Both attendance and meaningful contributions should be emphasized in the online discussions.
- The time and the number of synchronous communications should be arranged based on students' needs and expectations.
- The online discussions should be structured around cases, projects or problems given to the students in advance, and in the guidance of of predetermined rules.
- In order to increase interaction among the students, small groups can be formed and each group can be assigned a project, a problem or a case to work on. For each group, a discussion list can be assigned, and through online communication, the groups can produce solutions to their

assignments. For the new group activity, the group members can be changed to increase interactivity among the whole group members.

- The duration of the discussions should be long enough to allow full and thoughtful participation. At the end of the discussions, instructors together with an assigned students from the group should create a discussion report to publish/share.
- Participation to the discussions should be promoted with some points.

Guidelines for course structure in the online programs:

- The courses in the online programs should be selected properly and their topics should be arranged from the beginner to the advanced level.
- The number of courses and semesters in the program and duration of the program should be designed based on participants' properties.
- In the online program, especially certificate program, the course topics and contents should be selected from real life cases or it should be immediate value for participants.
- In designing each course, the characteristics of the course content and what types of outcomes are expected should be determined, and based on these, in the light of learning and instructional design theories each course should be designed.
- In order to help students comprehend the course content easly, each course should have rich instructional materials designed based on cognitive princiles (e.g. exercises, assignments, references books, cases, problems, activities and visuals), clear objectives, comprehensive syllabus, grading criteria, attandence policy and prerequisities,
- A glossary might be prepared for each course to eliminate misunderstanding among participants and instructors in the courses of the program. Also, online library might be designed to provide easy-access to the documents for the participants who want to attain further information and more skills.

Guidelines for institutional support in the online programs:

- During the registration to online program, participants should be informed about all the necessary issues and procedures of program.
- Before the program starts, an orientation on the guidelines about the nature of online learning and its requirements should be given to the students.
- Instructional support group that help instructors in the courses might be formed in the program.
- Immediate response (suggestions, answers, or directions) to the message should be given by the course instructors or administrators.
- Individual, timely and informative feedback can be given to the participants about their progress during entire program.
- A detailed and informative FAQ part should be prepared based on the questions that have been asked and answered over the semesters and years in the program.

Guidelines for flexibility in the online programs:

- The online program should provide flexibility of time and space to the learners. Therefore, it might provide several options that learners could select suitable one for their learning in related to timing and duration of learning, modes of learning, contents of learning, and assessment of learning.
- The structure of online programs might be dynamic and programs' components might be designed and updated based on learners' desires regularly during the learning process.
- In order to provide flexible program, time period for each semester can be extended. If it is not possible, only one course for each semester should be given to the students.
- The time of synchronous communication should be arranged based on the demand of learners. Based on the students' knowledge levels, several discussion groups can be formed, and different time period for synchronous communication can be arranged for each group.

- Based on their needs and interests, the students should be able to take elective courses for some portion of the courses in the program (e.g. 25%). This will provide some flexibility to the students.

5.4 Recommendations for Further Research

Online learning has been seen widely in higher education in the last years. Online courses and programs specifically are providing access to nontraditional students who are challenged by space and time. Student satisfaction is considered to be an important goal for many colleges and universities in both the traditional and online learning formats. Research concerning student satisfaction with the online format is important for administrators and instructors in the evaluation of courses and programs. Therefore, there is a need for further research in this area at different contexts. Based on the limitations of the current study and findings and methods of previous researches, the following recommendations are made to be investigated by further research:

- The current study examined a single case which cannot be widely generalized. Therefore, this study should be replicated within other programs, including other online certificate programs and online undergraduate or graduate programs to increase the generalizability of the findings to the general population.
- Most of the participants were not examined in this study due to the dropouts. Further studies examining student satisfaction could examine all possible participants included dropouts. Also, the reasons of the dropouts that related to satisfaction should be explored clearly.
- We need further studies related to that how the participants would use this certificate in their real life after graduate from this type of program since there is a huge human resource need that the results of the research related to this topic might also help design and improve this type of programs.
- Further investigation into other variables that may have an impact on online learner satisfaction (i.e. socio-economics, having job or not,

predisposing characteristics, life changes, learning style, motivational factors, environmental characteristics) should be undertaken.

- It could also be argued and recommended that interaction through computer mediated communication tools needs to be further researched from the perspective of the students and instructor in a more detailed way.
- One of the discussing issues is related to how to design online courses in the literature; therefore we need more research about design issues with several case studies.
- More longitudinal quantitative and qualitative study could analyze the student's satisfaction level as perceived by the instructor and student. In addition, analyzing the satisfaction level in the same course with a different instructor should be investigated.
- The design, development, and testing of a new instrument to predict student satisfaction and student perceptions in online learning is needed. Researchers today still rely on existing instruments that are not specifically designed for this particular environment.

REFERENCES

Allen, M., Bourhis, J., Burrell, N., & Mabry, E. (2002). Comparing student satisfaction with distance education to traditional classrooms in higher education: a meta-analysis. *The American Journal of Distance Education*, 16(2), 83-97.

Allen, E., & Seaman, J. (2004). *Entering the mainstream: The quality and extent of online education in the United States, 2003 and 2004*. Needham and Wellesley, MA: Sloan Consortium

Almeda, M.B. (1998). University of California extension online: From concept to reality. *Journal of Asynchronous Learning Networks*, 2(2), 1-20.

Arbough, J.B. (2000). Virtual classroom characteristics and student satisfaction with Internet-based MBA courses. *Journal of Management Education*, 24 (1), 32-54.

Astin, A.W. (1993). *What matters in college? Four critical years revisited*. San Francisco, CA: Jossey-Bass.

Azevedo, R., Guthrie, J. T., & Seibert, D. (2004). The role of self-regulated learning in fostering students' conceptual understanding of complex systems with hypermedia. *Journal of Educational Computing Research*, 30(1 & 2), 87-111.

Bandura, A.. (1986). *Social Foundations of Thought and Action: A Social Cognitive Theory*. Englewood Cliffs, NJ: Prentice-Hall

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: W.H. Freeman.

Barrett, E. & Lally, V. (1999). Gender differences in an on-line learning environment. *Journal of Computer Assisted Learning*, 15 (1), 48-60.

Bean, J. P., & Bradley, R. K. (1986). Untangling the satisfaction-performance relationship for college students. *General Hospital Psychiatry*, 57 (4), 393-412.

Belanger, F., & Jordan, D.H. (2000). *Evaluation and Implementation of Distance Learning: Technologies, Tools, and Techniques* . Hershey , PA : Idea Group Publishing.

Biner, P.M., Dean, R.S., & Mellinger, A.E. (1994). Factors underlying distance learner satisfaction with televised college-level courses. *The American Journal of Distance Education*, 8(1), 60-71.

Biner, P., Summers, M., Dean, R.S., Bink, M.L., Anderson, J.L., & Gelder, B.C. (1996). Student satisfaction with interactive telecourses as a function of demographic variables and prior telecourse experience. *Distance education*, 17 (1), 33-43.

Bogdan R. C., & Biklen, S. K. (1998). *Qualitative research for education: An introduction to theory and methods*. Boston: Allyn and Bacon.

Bolliger, D. (2004). Key Factors for Determining Student Satisfaction in Online Courses. *International Journal on E-Learning*, 3 (1), 61-67.

Bonk, C.J., Malikowski, S., Angeli, C., & East, J. (1998). Web-based case conferencing for preservice teacher education: Electronic discourse from the field. *Journal of Educational Computing Research, 19*(3), 267-304.

Brouard, R. C. (1996). The relationship between student characteristics, computer literacy, technologyacceptance, and distance education student satisfaction. *Dissertation Abstracts International*, 57(05), 2009A.

Burge, E. J. (1994). Learning in computer conferenced contexts: The learners' perspective. *Journal of Distance Education*, 9(1), 19-43.

Carswell, L. Thomas, P. Petre, M. Price, B. & Richards M. (1999). Understanding the Electronic Student: Analysis of Functional Requirements for Distributed Education, *Journal of Asynchronous Learning Networks*, 3(1), 7-18.

Chang, V. (1996). *Students' perception of the efficacy of web-based learning environment: The emergence of a new learning instrument.* Higher education research and development society of Australasia, Retrieved December 10, 2003, from http://www.herdsa.org.au/branches/vic/Cornerstones/pdf/Chang.PDF

Compeau, D.R., & Higgins, C.A. (1995). Computer self-efficacy: Development of a measure of initial test. *MIS Quarterly*, 19(2), 189-211.

Creswell, J. W. (1998). *Qualitative inquiry and research design: Choosing among five traditions.* Thousand Oaks, CA: Sage Pub.

Creswell, J., & Plano-Clark, V. (2007). *Designing and conducting mixed methods research*. Thousand Oaks, CA: Sage Pub.

Dag, I. (1991). The reliability and validity study of Rotter's IE/LOC scale for university students. *Turkish Journal of Psychiatry*, 7(26), 10-16.

Daugherty, M., & Funke, B.L. (1998). University faculty and student perceptions of Web-based instruction. *Journal of Distance Education*, 13(1), 21-39.

DeBourgh, G. A. (1999). *Technology is the tool, teaching is the task: Student satisfaction in distance learning.* San Antonio, TX: Society for Information Technology &Teacher Education International Conference (ERIC Document Reproduction Service No.ED432226).

Dennen, V. (2005). From message posting to learning dialogues: Factors affecting learner participation in asynchronous discussion. *Distance Education*, 26(1), 127-148.

Dille, B., & Mezack, M. (1991). Identifying predictors of high risk among community college telecourse students. *American Journal of Distance Education*, 5(1), 24-35.

Dillon, C., & Gunawardena, C. (1992) Evaluation research in distance education, *British Journal of Education*, 23(3), 181-194.

Eastmond, D. V. (1994). Adult distance study through computer conferencing. *DistanceEducation*, 15(1), 128-152.

Eom, S., Ashill, N., & Wen, J. (2006). The Determinants of students' perceived learning outcomes and satisfaction in university online education: an empirical investigation. *Decision Sciences Journal of Innovative Education*, 4(2), 215-235.

Feasely, C. & Olgren, C. (1998). *Evaluation for distance education*. Madison, WI: University of Wisconsin-Madison.

Finaly-Neumann, E. (1994). Course work characteristics an d students' satisfaction with instruction. *Journal of Instructional Psychology*, 21 (1), 14-21.

Fraenkel, J. R., & Wallen, N. E. (2000). *How to design & evaluate research in education* (4th Ed.). USA: McGraw-Hill Companies, Inc.

Fresen, J.W. (2005). *Quality assurance practice in online (web-supported) learning in higher education. An exploratory study.* Unpublished PhD thesis, University of Pretoria, South Africa. Retrieved June 30, 2006, from, http://upetd.up.ac.za/thesis/available/etd-02172005-134301.

Fulford, C. P., & Zhang, S. (1993). Perceptions of interaction: The critical predictor in distance education. *The American Journal of Distance Education*, 7(3), 8-21.

Furnell,S., Evans, M. Phippen,A., & Abu-Rgheff, M. (1999). Online distance learning: Expectations, requirements, and barriers. *Virtual University Journal*, 2(2), 34-41.

Gall, M. D., Gall, J. P., & Borg, W. R. (2003). *Educational Research: An Introduction* (7th ed.). Boston: Allyn & Bacon.

Graham, C., Cagiltay, K., Craner, J., Lim, B., & Duffy, T. M. (2000). *Teaching in a Web-based distance learning environment: An evaluation summary based on four courses. Center for Research on Learning and Technology Technical Report No. 13-00*. Indiana University Bloomington. Retrieved May 10, 2007, from http://crlt.indiana.edu/publications/crlt00-13.pdf

Guba, E. G., & Lincoln, Y. S. (1989). *Fourth generation evaluation.* Newbury Park, CA: Sage Publications.

Gunawardena, C. N., & Duphorne, P. L. (2001). *Which learner readiness factors, online features, and CMC related learning approaches are associated with learner satisfaction in computer conferences.* Paper presented at the Annual

Meeting of the American Educational Research Association (ERIC Document Reproduction Service No. ED4456160).

Hara, N., Bonk, C.J., & Angeli, C. (2000). Content analysis of online discussion in an applied educational psychology course, *Instructional Science*, 28(2), 115-152.

Hara, N. & Kling, R. (1999). Student frustrations with a web-based distance education course. *First Monday: Peer-Reviewed Journal on the Internet*, Retrieved April 5, 2006, from http://www.firstmonday.dk/issues/issue4_12/hara

Harasim L. (1990). Online education: An environment for collaboration and intellectual amplification. In L. Harasim (Eds.), *Online education: Perspectives on a new environment* (pp. 39-66). New York: Praeger Publishers.

Harasim, L., Hiltz, S. R., Teles, L. & Turoff, M. (1995). *Learning Networks: A Field Guide to Teaching and Learning Online*. Cambridge, MA: The MIT Press.

Herrington, J. & Oliver, R. (2000). An instructional design framework for authentic learning environments. *Educational Technology Research & Development*, 48(3), 23-48.

Hill, J. R., Rezabek, L. R. & Murry, B. (1998). *Web-based instruction: Prospects and challenges.* ERIC document.

Hill, T., Smith, N.D., & Mann, M.F (1987). Role of efficacy expectations in predicting the decision to use advanced technologies: The case of computers. *Journal of Applied Psychology*, 72(2). 307-313.

Hill, J. R., & Hannafin, M. J. (1997). Cognitive strategies and learning from the World Wide Web. *Educational Technology, Research and Development,* 45(4), 37- 64.

Hirumi, A. (2002). A framework for analyzing, designing and sequencing planned eLearning interactions. *The Quarterly Review of Distance Education*, 3(2), 141-160

Hofman, J. (2003). Motivating Online Learners, *Learning Circuits,* Retrieved November 12, 2006, from http://www.learningcircuits.org/2003/aug2003/hofmann.htm

Holmberg, B. (1989). *Theory and Practive of Distance Education*. New York: Routledge.

Houle, C. O. (1961). *The inquiring mind: A study of the adult who continues to learn.* Madison: University of Wisconsin Press.

Howland, J., & Moore, J. (2002). Student perceptions as distance learners in Internet-based courses. *Distance Education,* 23(3), 183-195.

Institute for Higher Education Policy. (2000) *Quality on the line: Benchmarks for success in internet-based distance education*. Washington, DC: Author. Retrieved November 12, 2006, from http://www.ihep.com/Pubs/PDF/Quality.pdf

Jegede, O.J., Fraser, B., & Curtin, D.F. (1995). The development and validation of a distance and open learning environment scale. *Educational Technology Reseach and Development*, 43(1), 90-94.

Johnson, K. R. (1993). *An analysis of variables associated with student achievement and satisfaction in a university distance education course.* Unpublished doctoral dissertation, New York State University, Buffalo.

Johnson, S.D., Aragon, S.R., Shaik, N., & Rivas, N.P. (2000). Comparative analysis of online versus face-to-face instruction. Association for the advancement of computing in education. Retrieved May 07, 2003, from http://www.aace.org/dl/files/JILR11129.pdf

Jonassen, D. J., & Grabowski, B. L. (1993). *Handbook of Individual Differences, Learning, and Instruction.* Hillsdale, NJ: Lawrence Erlbaum Associates.

Joo, Y. J., Bong, M., & Choi, H. J. (2000). Self-efficacy for self-regulated learning, academic self-efficacy, and Internet self-efficacy in web-based instruction. *Educational Technology Research & Development,* 48(2), 5–17.

Kearsley, G. (2000) *Online education: Learning and teaching in cyberspace*. Belmont, CA: Wadsworth.

Keegan, D. (1996). *Foundations of distance education*. London: Routledge

Keller, J. M. (1999). Motivation in cyber learning environments. *Educational Technology International,* 1(1), 7 -30.

Kelsey, K. D., Lindner, J. R., & Dooley, K. E. (2002). Agricultural education at a distance: Let's hear from the students. *Journal of Agricultural Education*, 43(4), 25-33.

Kerka, S. (1996). *Distance learning, the Internet, and the World Wide Web*. ERIC Clearinghouse on Adult Career and Vocational Education, Columbus, OH. (ERIC Document Reproduction Service No. ED 395 214).

Kerlinger, F. N. (1986). *Foundations of behavioral research.* New York: Holt, Rinehart and Winston.

Khan, B. (1997). Web-based instruction (WBI): What is it and why is it? In B. Khan (Ed.), *Web-based instruction* (pp. 5–18). Englewood Cliffs, NJ: Educational Technology Publications, Inc.

Kirkpatrick, D. (1998). *Evaluating training programs: the four levels*. San Francisco: Berrett-Koehler.

Knowles, M. (1984). *The Adult Learner: A Neglected Species (3rd Ed.)* Houston, TX: Gulf Publishing

Knowles, M.S., Holton, E. F., & Swanson, R. A. (1998). *The adult learner. (5th ed.).* Houston, TX: Gulf Publishing

Kuchinke, K. P., Aragon, S., & Bartlett, K.(2001). Online instructional delivery: Lessons from the instructor's perspective. *Performance Improvement*, 40(1), 19-27.

Lim, C. K. (2001). Computer self-efficacy, academic self-concept, and other predictors of satisfaction and future participation of adult distance learners. *The American Journal of Distance Education*, 15(2), 41-51.

Lincoln Y.S. (1995). Emerging criteria for qualitative and interpretive research. *Qualitative Inquiry*, 3 (1), 275-289.

Long, P., Tricker, T., Rangecroft, M., & Gilroy, P. (1999). Measuring the satisfaction gap;Education in the market-place. *Total Quality Management*, 10(4/5), 772-778.

Lumsden, L. (1999). *Student motivation: Cultivating a love of learning. Eugene*, OR: ERIC Clearinghouse on Educational Management. (ERIC Document Reproduction Service No. ED443135).

Lynch, R. & Dembo, M. (2004). The relationship between self-regulation and online learning in a blended learning context. *International Review of Research in Open and Distance Learning*, 5 (2). Retrieved September 1, 2005, from http://www.irrodl.org.content/v5.2/lynch-dembo.html

Maki, R. H., Maki, W. S., Patterson, M., & Whittaker, P. D. (2000). Evaluation of a Web-based introductory psychology course: I. Learning and satisfaction in on-line versus lecture course. *Behavior Research Methods, Instruments, & Computers*, 32(2), 230-239.

Marshall, C. & Rossman, G.B. (1999). *Designing qualitative research (3rded.).* Thousand Oaks: Sage Publications.

McPherson, M.A., & Nunes, J.M. (2004) *Developing Innovation in Online Learning: An Action Research Framework*. London: RoutledgeFalmer.

McVay, M. (2000). *Developing a Web-based distance student orientation to enhance student success in an online Bachelor's degree completion program.* Unpublished practicum report presented to the Ed.D. Program, Nova Southeastern University, Florida.

McVay, M. (2001). *How to be a successful distance learning student: Learning on the Internet.* New York: Prentice Hall.

Merriam, S.B. (1998). *Qualitative Research and Case Study Applications in Education*. San Francisco: Jossey-Bass Inc.

Meyer, K. A. (2002). Quality in Distance Education: Focus on On-line Learning. In A.J. Kezar (Ed.), *ASHE-ERIC Higher Education Report* (Vol. 29, pp. 1-134). Jossey-Bass.

Miller, G., & Pilcher, C.L. (2000). Do off-campus courses possess a level of quality comparable to that of on-campus courses? *Journal of Agricultural Education*, 41(3), 60-69.

Miltiadou, M., & Yu, C. H. (2000). *Validation of the online technologies self-efficacy survey (OTSES)*. Paper presented at the Association for Educational Communications and Technology (AECT) International Convention, Denver CO.

Moore, M. (1989). Three types of interaction. *The American Journal of Distance Education*, 3(2), 1-6.

Moore, M. G. (1991). Editorial: Distance education theory. *The American Journal of Distance Education*, 5(3), 1–6.

Moore, M. (1994). Autonomy and interdependence. *The American Journal of Distance Education*, 8(2), 1-5.

Moore, J. (2002). *Elements of Quality: The Sloan-C Framework*. Needham, MA: Sloan Center for Online Education

Moore, M. G., & Kearsley, G. (1996). *Distance education: A systems view*. Belmont, CA: Wadsworth Publishing Company

Moore, M. G., & Kearsley, G. (2005). *Distance education: A systems view, 2nd edition*. Belmont, CA: Wadsworth Publishing Company.

Morgan, D.L. (1998). *Planning focus groups.* Thousand Oaks, CA: Sage.

National Center for Education Statistics (NCES), (2003). *Distance Education at Degree Granting Postsecondary Institutions: 2000-2001*. NCES 2003-017. Retrieved May 9, 2007, from http://nces.ed.gov/pubs2003/2003017.pdf

Northrup, P. T. (2001). A framework for designing interactivity into web-based instruction. *Educational Technology*, 41(2), 31-39.

Northwest Regional Educational Laboratory (NREL) (2004). Developing Self-Directed Learners. Retrieved May 9, 2007, from http://www.nwrel.org/planning/reports/self-direct/

Ozkul, A. E. (2001). Anadolu University Distance Education System From Emergence to 21st Century. *The Turkish Online Journal of Distance Learning*, 2(1), Retrieved November 12, 2006, from http://tojde.anadolu.edu.tr/tojde3/2/ekremtxt.htm

Pajo, K., & Wallace, C. (2001). Barriers to the uptake of web-based technology by university teachers. *Journal of Distance Education, 16* (1), 70-84.

Parker, A. (1999). A study of variables that predict dropout from distance education. *International Journal of Educational Technology*, 1(2). Retrieved June 30, 2006, from http://www.outreach.uiuc.edu/ijet/v1n2/parker/

Parlak, O. (2004). *Student Satisfaction Scale on Internet Based Distance Education.* Unpublished MS Thesis, Graduate School of Educational Science, Ankara University, Ankara, Turkey.

Patton, M. Q. (1990). *Qualitative evaluation and research methods (2nd ed.).* Newbury Park, CA: Sage.

Patton, M. Q. (2001). *Qualitative evaluation and research methods (3rded.).* Thousand Oaks, CA: Sage Publications.

Peters, O. (1965). Distance Education: Sources for the Analysis of a New Form of Teaching.

Phipps, R., & Merisotis, J. (1999). *What's the difference: A review of contemporary research on the effectiveness of distance learning in higher education*. Washington, DC: The Institute for Higher Education Policy.

Pintrich, P. R. (1995). Understanding self-regulated learning. In P. Pintrich (Ed.), *Understanding Self-regulated Learning* (pp. 3-12). San Francisco: Jossey-Bass Publishers.

Pintrich, P.R., & De Groot, E.V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology,* 82 (1), 33-40.

Postema M. & Markham, S. (2001). A methodology for subject evaluation. Defining student satisfaction. Retrieved June 22, 2003, from http://cerg.csse.monash.edu.au/reports/satisfaction_2003.htm

Potashnik, M., & Capper. J. (1998). Distance Education: Growth and Diversity. *Finance and Development*, 35(1), 42-45.

Renchler, R. (1992). *Student motivation, school culture, and academic achievement: What school leaders can do* [Trends and issues paper]. Eugene, OR: ERIC Clearinghouse on Educational Management. (ERIC Document Reproduction Service No. ED351741)

Rotter, J.B.(1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs,* 33(1), 300-303.

Rumble, G. (1997). *The costs and economics of open and distance learning*. London: Kogan Page Limited.

Rumble, G. (2000). Student support in distance education in the 21st century: Learning from service management. *Distance Education*, 21 (2), 216-235.

Russell, T.L. (1999). *The no significant difference phenomenon.* Montgomery, AL: The International Distance Education Certification Center.

Saba, F (1999). Toward a systems theory of distance education. *The American Journal of Distance Education*, 13(2), 24-31.

Sankaran, S. R. & Bui, T. (2001). Impact of learning strategies and motivation on performance: A study in web-based instruction. *Journal of Instructional Psychology*, 28(3), 191-198.

Schwitzer, A.M., Ancis, J.R., & Brown, N. (2001). *Promoting student learning and student development at a distance.* American College Personnel Association.

Schunk, D.H., & Zimmerman, B.J. (1998). *Self-regulated learning: From teaching to self-reflective practice*. New York: Guilford Press.

Sener, J. & Humbert, J. (2003) Student satisfaction with online learning: an expanding universe. In J. Bourne & J. C. Moore (Eds), *Elements of Quality Online Education: Practice and Direction*, (pp. 245–260). Needham, MA: Sloan Center for Online Education.

Shale, D., & Garrison, D. R. (1990). Education and communication. In D. R. Garrison & D. Shale (Eds.) *Education at a distance: From issues to practice*, 23-29. Malibar, FL: Krieger.

Shih, C. C., & Gamon, J. (2001). Web-based learning: Relationships among student motivation, attitude, learning styles, and achievement. *Journal of Agricultural Education 42*(4), 12-20.

Simonson, M. (1995) Does anyone really want to learn at a distance? *Tech Trends*. 40 (5), 12.

Simonson, M., Schlosser, C. & Hanson, D. (1999). Teaching and distance education: A New discussion. *The Ameriacan Journal of Distance Education*, 13(1), 60-75

Simonson, M., Smaldino,S., & Albright M. (2000). *Teaching and Learning at a Distance Foundations of Distance Education*. Upper Saddle River, NJ: Prentice Hall.

Smith, P. J., Murphy, K. L., & Mahoney, S. E. (2003). Identifying factors underlying readiness for online learning: An exploratory study. *Distance Education*, 24, 57–68.

Song, S. H. (2000). Research issues of motivation in Web-based instruction. *Quarterly Review of Distance Education*, 1(3), 225-229.

St. Pierre, S . & Olsen, L. K. (1991). Student perspectives on the effectiveness of correspondence instruction. *The American Joumal of Distance Education*. 5(3), 65-71.

Stone, T. E. (1992). A new look at the role of locus of control in completion rates in distance education. *Research in Distance Education*, 4 (2), 6-9.

Swan, K. (2001). Virtual interaction: Design factors affecting student satisfaction and perceived learning in asynchronous online courses. *Distance Education*, 22(2), 306-331.

Tallman, F. D. (1994). Satisfaction and completion in correspondence study: The influence of instructional and student-support services. *The American Journal of Distance Education*, 8(2), 43-57.

Taplin, M., & Jegede, O. (2001). Gender differences in factors influencing achievement of distance education students. *Open Learning*, 16(2), 133-154.

Tashakkori, A. & Teddlie, C. (2003) *Handbook of Mixed Methods in social & behavioural research*, SAGE publications.

Thompson, M. M. (1998). Distance learners in higher education. In C. C. Gibson (Ed.), *Distance learners in higher education: Institutional responses for quality outcomes* (pp. 9-24). Madison, WI: Atwood Publishing.

Thurmond, V.A., Wambach, K., Connors, H.R., & Frey, B.B. (2002). Evaluation of student satisfaction: Determining the impact of a web-based environment by controlling for student characteristics. *The American journal of distance education*, 16(3), 169-189.

Tricker, T., Rangecroft, M., Long, P., & Gilroy, P. (2001). Evaluating distance education courses: the student perception. *Assessment & Evaluation in Higher Education*, 26(2), 165-177.

University of New Mexico. (2001). Complete ICES Forms. Retrieved October 28, 2002, from http://www.unm.edu/cirt/ices/forms.html

Vrasidas, C. & McIsaac, S.M. (1999). Factors influencing interaction in an online course. *The American Journal of Distance Education*, 13 (3), 22-36.

Verduin, J.R., & Clark, T.A. (1991) *Distance education*. San Francisco, CA: Jossey-Bass.

Vonderwell, S. (2003). An examination of asynchronous communication experiences and perspective of students in online courses. *The Internet and Higher Education*, 6(1), 77-90.

Wang, A.Y. & Newlin, M. H. (2002). Predictors of web student performance: The role of self-efficacy and reasons for taking an on-line class. *Computers in Human Behavior*, 18(2), 151-163.

Warner, D., Christie, G., & Choy, S. (1998). *The readiness of the VET sector for flexible delivery including on-line learning*. Brisbane: Australian National Training Authority

Wedemeyer, C. A. (1971). Independent study. In R. Deighton (Ed.), *Encyclopedia of Education IV* (p. 548-557). New York: McMillan

Whipp, J.L., & Chiarelli, S. (2004). Self-regulation in a web-based course: A case study. *Educational Technology Research and Development*, 52(4), 5-22

Wiesenberg, F., & Hutton, S. (1996). Teaching a graduate program using computer-mediated conferencing software. *Journal of Distance Education*, 11(1), 83-100.

Woods, R.H. Jr. (2002). How much communication is enough in online courses? Exploring the relationship between frequency of instructor-initiated personal email and learners's perceptions of and participation in online learning. *International Journal of Instructional Media*, 29(4), 377-394.

Yazici, A., Altas, I., &, Demiray,U. (2001). Distance Education on the Net : A model for Developing Countries. *The Turkish Online Journal of Distance Learning*, 2(2). Retrieved November 12, 2006, from http://tojde.anadolu.edu.tr/tojde4/aiutext.html

Yin, R. (1994). *Case study research: Design and methods* (2nd ed.). Beverly Hills, CA: Sage Publishing.

Yukselturk, E. (2005). Online Information Technologies Certificate Program, *Turkish Online Journal of Distance Education-TOJDE*, 6(1). Retrieved April 15, 2007, from http://tojde.anadolu.edu.tr/tojde17/pdf/erman.pdf

Yukselturk, E. & Inan, F.A. (2006). Examining the Factors Affecting Student Dropout in an Online Certificate Program, *Turkish Online Journal of Distance Education-TOJDE*, 7 (3). Retrieved April 15, 2007, from http://tojde.anadolu.edu.tr/tojde23/pdf/article_6.pdf

Yukselturk, E. & Top, E. (2006), Reconsidering Online Course Discussions: A Case Study, *Journal of Educational Technology Systems*, 34(3), 341-367.

Yukselturk, E. & Yildirim, Z. (2004). *A-three year analysis of online information technologies certificate program.* World Conference on Educational Multimedia, Hypermedia and Telecommunications 2004 (EDMEDIA 2004),Lugano,Switzerland.

Zimmerman, B. J. (1986). Becoming a self-regulated learner: Which are the key subprocesses? *Contemporary Educational Psychology*, 11(4), 307-313.

Zimmerman, B. J. (2002). Becoming a Self-Regulated Learner: an overview. *Theory into Practice*, 41(2), 64-70.

Zimmerman, B.J., & Martinez-Pons, M. (1990). Student differences in self-regulated learning: Relating grade, sex, and giftedness to self-efficacy and strategy use. *Journal of Educational Psychology*, 82 (1), 51-59.

Zimmerman, B.J., Greenberg, D., & Weinstein, C.E. (1994). Self-regulating academic study time: A strategy approach. In D.H. Schunk & B.J.Zimmerman (Eds.), *Self-regulation of learning and performance: Issues and educational applications* (pp.181-202). Hillsdale, New Jersey: Lawrence Erlbaum Associates.

APPENDIX A

INSTRUMENTS USED IN THE STUDY

Sayin IDEA/BTSP katilimcisi,

Sertifika programina baslarken size bir dizi anket verilecektir. Bu anketlerin amaci programa baslarken sizinle ilgili daha ayrintili bilgi sahibi olmak ve BTSP programi ile internet üzerinden egitim hakkinda görüslerinizi ögrenmektir. Anket üç bölümden olusacaktir. Birinci bölüm genel bilgiler, ikinci bölüm BTSP öncesi bilgi düzeyiniz ve üçüncü bölüm internet ve internet üzerinden egitim hakkindadir. Sorulara verdiginiz cevaplar, yalnizca ve kesinlikle arastirma amaciyla kullanilacaktir. Sorulari doldurdugunuz için simdiden tesekkür ederiz.

Erman Yükseltürk, BÖTE, ODTU,
ermany@metu.edu.tr

Genel Bilgiler

Programa katilim amaçlariniz nelerdir?

O Bilgi teknolojilerini ögrenmek ya da bilgilerimi yenilemek
O Is bulmak
O Isim var, ikinci bir is olanagi yaratmak
O Mevcut isimde ve meslegimde yükselmek daha verimli olmak
O Akademik egitimim için referans sahibi olmak
Diger:.....

Daha önce internet üzerinden ders aldiniz mi?

O Evet O Hayir

Cevabiniz Evetse hangi dersleri:.....

Program Öncesi Bilgi Seviyeniz

Sertifika programinda verilen 8 dersle ilgili bilgi seviyenizi **1(hiç bilmiyorum) - 4(çok iyi biliyorum)** arasinda isaretleyiniz.

Giris düzeyinde bilgisayar sistemlerinin yapilarini, yazilim donanim ve bunlari olusturan parçalari içeren konulari ve merkezi islemci, bellekler, giris/çikis prensiplerini	1 2 3 4 O O O O
Temel programlama kavram ve uygulamalarini (örn: degiskenler, seçenege dayali islemler, döngüler vb.) kullanarak C programlama dilinde degisik programlar yazmayi	1 2 3 4 O O O O
Temel veri yapilari ve algoritmalari (örn: göstergeçler(pointer), diziler (array), yigit (stack) kuyruk(queue), agac(tree), siralama, arama vb.) kullanarak problemleri çözüp C dilinde uygulama gelistirmeyi	1 2 3 4 O O O O
Isletim sistemleri ile ilgili kuramsal temelleri ve bu temelleri çoklu kullanici isletim sistemi olan Unix üzerinde örneklendirmeyi	1 2 3 4 O O O O
Yazilim sistemlerinin gelistirilmesinde gerekli olan kavram ve metodolojiler hakkinda bilgileri	1 2 3 4 O O O O
Veri Tabani Yönetim Sistemleri ile ilgili kuramsal temelleri, iliskisel veri modeli'nin ve veri tabani tasarimini	1 2 3 4 O O O O
Web programlama uygulamalarini (örn: Html, Php, Xml, Java vb.)	1 2 3 4 O O O O
Yazilim gelistirmeyi ve yazilim gelistirirken gerekli dökümanlari hazirlamayi	1 2 3 4 O O O O

Çevrim-içi (Online) Ögrenmeye Hazir Olma Ölçegi

Asagidaki cümleleri çevrim-içi(online) ögrenme ortamini düsünerek size göre en uygun rakamin altina "X" isareti koyunuz.

1 = "Nadiren", 2 = "Arasira", 3 = "Genellikle", 4 = "Her zaman"

	1	2	3	4
1) Çalismalarim için gerektiginde kolaylikla Internete erisebilirim.				
2) Baskalariyla Internet üzerinden rahat iletisim kurabilirim.				
3) Internet ortaminda,diger ögrenci arkadaslarimla ve ögretmenlerimle aktif olarak iletisim kurmaya istekliyim.				
4) Etkili çalismak için her hafta belirli bir zaman ayirmaya istekliyim.				
5) Çevrim-içi (Online) egitimin en az yüz yüze sinif egitim ile esit kalitede oldugu kanisindayim.				
6) Deneyimlerimi ve bilgi birikimimi çalismalarimda kullanmamin yeni seyler ögrenmemde yararli olacagi kanisindayim.				
7) Çevrim-içi (Online) yazili iletisim yaparken rahat olurum.				
8) Ögrenme ve çalisma zamani konularinda kendi kendimi yönlendiren birisiyim.				
9) Derste ögrendiklerimi yeniden gözden geçirmem yeni seyler ögrenmemde yardimci olur.				
10) Çalismalarimda, kendi kendimi disipline ederim ve okuma ve ev ödevlerimi yapmak için zaman ayiririm.				
11) Çalisma zamanimi kolaylikla ve verimli sekilde düzenleyerek ödevlerimi zamaninda yapabilirim.				
12) Ögrenci olarak, en az destek veya etkilesimle kendi kendime çalismaktan hoslanirim.				
13) Çalismalarimda, amaçlarimi belirler, yüksek derecede insiyatif kullanirim.				

Çevrim-içi (Online) Teknolojilerine Yönelik Öz-Yeterlilik Ölçegi

Asagidaki cümleleri çevrim-içi(online) teknolojilerine yönelik yeterliliklerinizi düsünerek size göre en uygun rakami altina "X" isareti koyunuz**. 1 = "Hiç emin hissetmem", 2 = "Pek emin hissetmem", 3 = "Biraz emin hissederim", 4 = "Çok emin hissederim".**

Internet Becerileri

Su konularda kendimi yeterli hissederim:	1	2	3	4
1) Web tarayici açarken (örnek: Netscape or Explorer)				
2) Web sayfasindan metin okurken				
3) Belirli bir web sayfasini ziyaret etmek için baglantiya(link) tiklarken				
4) Adresini (URL) yazarak belirli bir web sayfasina erisirken				
5) Web sayfasini isaretlerken (Bookmarking)				
6) Web sayfasini yazdirirken				
7) Bir veya birden fazla kelime ile Internette arama yaparken				
8) Web sayfasindan bilgisayarima resim indirirken (saklarken)				
9) Web sayfasindan bir bölüm metni kopyalarken ve bunu kelime islemcideki (örn: MS Word) dökümana yapistirirken				

Es-zamanli Etkilesim (örn: ICQ,mIRC, gibi)

Su konularda kendimi yeterli hissederim:	1	2	3	4
10) Es zamanli (senkron) sohbet sistemlerinde takma ad saglarken (eger gerekli ise)				
11) Es zamanli sohbet sistemlerinde bir veya birden fazla katilimcinin mesajini okurken				
12) Es zamanli sohbet sistemlerinde, mesaj cevaplarken veya kendi mesajimi yazarken (birden birçoga etkilesim)				
13) Es zamanli sohbet sistemlerinde bir katilimciyla özel etkilesime geçerken (bire bir etkilesim)				

Es-zamansiz Etkilesim-1 (örn: e-posta gibi)

Su konularda kendimi yeterli hissederim:	1	2	3	4
14) Bir e-posta sisteminde oturum açarken ve kapartirken (logging on and off)				
15) Belirli bir kisiye e-posta mesaji gönderirken (bire bir etkilesim)				
16) Bir e-posta mesajini birden fazla kisiye ayni zamanda gönderirken (birden birçoga etkilesim)				
17) Bir e-posta mesajini cevaplarken				
18) Bir e-posta mesajini iletirken (Forwarding)				
19) E-postayla gelmis bir mesaji silerken				
20) Adres defteri olustururken				
21) E-posta mesajini eklenmis olarak gönderilen dosyayi bilgisayarima kaydederken ve bu dosyanin içerigini görürken				
22) Bir dosyayi (resim veya metin) e-posta mesajina eklerken ve gönderirken				

Es-zamansiz Etkilesim-2 (Örn:Tartisma gruplari gibi)

Su konularda kendimi yeterli hissederim:	1	2	3	4
23) Es zamansiz (asenkron) görüsme sisteminde oturum açarken ve kapartirken (signing on and off)				
24) Es zamansiz bir görüsme sistemine mesaj gönderirken (yeni bir konu basligi olustururken)				
25) Es zamansiz bir görüsme sistemine gönderilmis bir mesaji okurken				
26) Es zamansiz bir görüsme sistemine gönderilmis bir mesaja herkesin görebilecegi bir cevap yazarken (herkese cevap yazarken)				
27) Es zamansiz bir görüsme sisteminde gönderilmis bir mesaja sadece bir kisinin görebilecegi bir cevap yazarken (gönderene cevap yazarken)				
28) Es zamansiz bir görüsme sisteminden kendi (yerel) bilgisayarima bir dosya indirirken (download/kaydetmek)				
29) Es zamansiz bir görüsme sistemine dosya yüklerken (upload/göndermek)				

APPENDIX B

INTERVIEW SCHEDULE WITH PARTICIPANTS

Merhaba,

Biliyorsunuz adim Erman Yükseltürk, ODTU Bilgisayar ve Ögretim Teknolojileri Egitimi bölümünde doktora yapiyorum ve ayni zamanda katilimcisi oldugunuz Internete Dayali Egitim_ Asenkron Bilgi Teknolojileri Sertifika Programinda arastirma görevlisi olarak görev aliyorum. Doktora çalismam için bu programdaki memnuniyetiniz ile ilgili olarak sizinle görüsmek istiyorum. Bu görüsmede amacim, bir katilimcisi olarak bu programdaki memnuniyetinizi etkileyen faktörleri ortaya çikarmaktir. Programa katilan birçok katilimciyla her dönem sonunda görüsmeler yapiyorum. Simdide sizinle görüsme yapmak istiyorum.

Arastirmanin amaci, çevrim-içi bir programa katilan ögrencilerin memnuniyetlerini nelerin etkilendigini ve bu etkinlerin sizin memnuniyetinizle olan iliskilerini ögrenmek ve böylece bu programin veya çevrim-içi benzer programlarin tasariminda katkida bulunacak veri toplamaktir. Bu nedenle, bu program esnasinda ne tür deneyimler yasadiginizi, diger ögrencilerle ve derslerin ögretim üyeleriyle iletisim ve etkilesimlerinizi, derslerin yapisi, programdaki ögrenci destek sistemlerini, programdaki esneklik hakkinda düsüncelerinizi ve önerilerinizi almak istiyorum. Görüsmemizin yaklasik 30 dakika sürecegini düsünüyorum. Görüslerinizi benimle paylastiginiz için simdiden tesekkür ederim.

Görüsmeye baslamadan önce, görüsmemizin ve görüsmemizde konusulacaklarin gizli oldugunu ve arastirma sonuçlarini yazarken kimliginiz ile ilgili bilgilerin raporda kesinlikle yansitilmayacagini belirtmek isterim. Ayrica kimliginiz hakkindaki bilgileri ne programdaki ögretim üyelerine nede program koordinatörlerine verilmeyecegini söyleyebilirim. Benim programda görev almam sizide daha rahatlamasini isterim. Çünkü program içindeki her türlü olumlu ve olumsuz durumlari ve sorunlarinizi söyleyebileceginiz bir firsat olarak görebilirsiniz. Çalismam için görüsmemizi kayit etmek istiyorum. Izin verir misiniz? Görüsme sonunda isterseniz kayitlari silebiliriz. Ayrica, görüsme tamamlandiktan sonra kayitlari yazili hale getirip çalismamda kullanmadan önce sizin onayinizi alacagim, bu konuda hiç bir tereddütünüz olmasini istemedigimi belirtmek isterim.

Baslamadan önce, bu söylediklerimle ilgili sormak istediginiz bir soru ve belirtmek istediginiz bir konu var mi? Eger yok ise, izin verirseniz sorulara baslamak istiyorum.

- Ilk olarak programa ne zaman kayit olmaya karar verdiniz, baslamadan önce neler düsündünüz ve suana kadar izlenimleriniz nelerdir?

Iletisim hakkindaki sorumlarima geçiyorum:

- Programdaki iletisim hakkinda neler düsünüyorsunuz? Nasil olmasini isterdiniz?
- Suana kadar programdaki diger ögrencilerle iletisiminiz nasildi? Bu konuda neler söylebilirsiniz?
    - Netür amaçlar için diger ögrencilerle görüsüyor sunuz? Biraz açarmisiniz?
    - E-mail, chat ve tartisma grubundaki iletisimin faydalari sizce neler? Bu iletisimler hakkinda neler hissediyor sunuz? Neden?
    - Ne gibi sinirliliklari, dez avantajlari vardi?
- Suana kadar programdaki ögretim elemanlari (hoca ve asistan) iletisiminiz nasildi bu konuda neler söylersiniz?
    - Ögretim elemanlari (hoca ve asistan) ne zaman ve hangi ihtiyaçlarinizdan dolayi görüsdü nüz?
    - Bu iletisim hakkinda genel olarak neler hissediyor sunuz? Neden?

Dersler hakkinda sorumlarima geçiyorum:

- Programdaki dersler hakkinda neler söylersiniz?
    - Amaci, içerigi, örnekleri, alistirmalari, ödevleri, kapsami, isleyisi, sinavlari sizce nasildi?
        - Online olmasi, Uygunlugu, tatmin ediciligi açisinda degerlendirir misin?
    - Sizce, daha iyi olmasi için neler yapilmali? Örnek verebilir misiniz?

Destek hakkinda sorumlarima geçiyorum:

- Programda size verilen destek hakkindaki düsünceleriniz nelerdir? Nasil olmasini isterdiniz?
    - Istediginiz zaman destek alabildiniz mi? Örnek verebilir misiniz?
    - Geri bildirimler hakkinda neler söylersiniz?
    - Sizce, ögrencilerin daha iyi destek almalari için neler yapil mali?

Avantajlar/Dezavantajlari hakkinda sorumlarima geçiyorum:

- Programin size sagladigi imkanlari düsünürseniz, ne gibi kolayliklar, avantajlar var? Örnekler verebilir misiniz?
    - Programin size kazandirdigi esneklikler neler?
- Bunlarin yaninda ne gibi zorluklarla/sinirliliklarla karsilastiniz? Örnekler verebilir misiniz?
- Program esnasinda, karsilastiginiz olumsuz durumlar oldu mu? Neler açiklarmisiniz?

Programdaki basari hakkinda sorumlarima geçiyorum:

- Programda basarili olmanin kosullari sizce nelerdir? Nelere dikkat etmek gerekir?
    - Siz nekadarini yapabildiniz?
- Derslerde basarisiz olursaniz bunu hangi nedenlere baglarlar siniz? Neden? Açiklarmisiniz?
- Progrdamdan beklentileriniz nelerdi? Bunlarin hangileri karsilandi, açiklarmisiniz?
- Programdaki memnuniyetiniz hakkinda neler söylersiniz?

Programi birakma hakkinda sorumlarima geçiyorum:

- Programi birakma nedenlerinizi siralarmisiniz?
    - Kendinizden kaynaklanan sebepler nelerdir?
    - Programdan kaynaklanan sebepler nelerdir?
- Programdan neler bekliyordunuz?
    - Hangi beklentileriniz karsilandi hangileri karsilanmadi?
- Ilerde tekrar bu programa katilmayi düsünürmüsünüz? Neden?
    - Baska online ders veya sertifika programina katilmayi düsünürmüsünüz?

APPENDIX C

INTERVIEW SCHEDULE WITH INSTRUCTORS

Merhaba hocam,

Internete Dayali Egitim_ Asenkron Bilgi Teknolojileri Sertifika Programinda uzun süredir arastirma görevlisi olarak görev aliyorum ve ayni zamanda ODTU Bilgisayar ve Ögretim Teknolojileri Egitimi bölümünde doktora yapiyorum. Doktora çalismam için bu programdaki katilimci memnuniyetleri ile ilgili olarak sizinle görüsmek istiyorum. Bu görüsmede amacim, bir egitmen olarak bu programdaki katilimci memnuniyetlerini etkileyen faktörleri ortaya çikarmaktir. Programdaki diger ögretim üyeleriyle de her dönem sonunda görüsmeler yapiyorum. Simdide sizinle görüsme yapmak istiyorum.

Arastirmanin amaci, çevrim-içi bir programa katilan ögrencilerin memnuniyetlerini nelerin etkilendigini ve bu etkinlerin iliskilerini ögrenmek ve böylece bu programin veya çevrim-içi benzer programlarin tasariminda katkida bulunacak veri toplamaktir. Bu nedenle, bu program esnasinda ne tür deneyimler yasadiginizi, ögrencilerle iletisim ve etkilesimlerinizi, verdiginizin dersin yapisi, programdaki ögrenci destek sistemini, programin size ve ögrencilere sagladigi esneklikler hakkinda düsüncelerinizi ve önerilerinizi almak istiyorum. Görüsmemizin yaklasik 30 dakika sürecegini düsünüyorum. Görüslerinizi benimle paylastiginiz için simdiden tesekkür ederim.

Görüsmeye baslamadan önce, görüsmemizin ve görüsmemizde konusulacaklarin gizli oldugunu ve arastirma sonuçlarini yazarken kimliginiz ile ilgili bilgilerin raporda kesinlikle yansitilmayacagini belirtmek isterim. Çalismam için görüsmemizi kayit etmek istiyorum. Ayrica, görüsme tamamlandiktan sonra kayitlari yazili hale getirip çalismamda kullanmadan önce sizinde fikrinizi alacagim. Baslamadan önce, bu söylediklerimle ilgili sormak istediginiz bir soru ve belirtmek istediginiz bir konu var mi? Eger yok ise, izin verirseniz sorulara baslamak istiyorum.

- Bir egitmen olarak, örgün (yüzyüze) egitim vermekle online egitim vermeyi karsilastirir misiniz? (Derslerin hazirlanislarindan verilip tamamlanmasina kadar süreçteki, zorluklari, kolayliklari benzerlikleri)
- Online egitim alan ögrencilerle, örgün egitim alan ögrencileri özellikleri açisindan karsilatirabilir misiniz?

- Sizce bu online programda hangi tip ögrenciler *memnun ve basarili*? Bu ögrencilerin özellikleri hakkinda neler söylersiniz?
    - Personel karakterleri hakkinda neler söylersiniz (cinsiyeti, yasi, egitimi, önceki deneyimleri, çalisip çalismadigi, gibi)
    - Diger özellikleri hakkinda neler söylersiniz, örnegin (teknolojik yeterlilikleri, motivasyonlari yada hazir olma durumlari, beklentileri, ögrenme biçimleri, zamani kullanma becerileri)
- Hangi tip ögrenciler daha *memnun* kaliyor daha detayli bilgi verebilir misiniz? Örnekler verebilir misiniz?
- Sizce hangi tip ögrenciler basarisiz oluyor yada programi yarida birakiyorlar? Neden?

- Dersinizdeki gerçeklesen iletisimi düsünürseniz, basarili ve memnun ögrenciler neler yapiyorlar?
    - Ögrenci-ögrenci arasinda ve ögrenci-ögretmen arasinda iliskileri nasildi, örnekler verebilir misiniz?

- Sizce, dersinizde ögrenciler en çok nerleri *seviyor* ve en çok hangi konularda *basarili* oluyor? (examples, chat, discussion list, homework, exam)
- Dersinizde ögrenciler nerelerde *zorlaniyor*?

- Ögrencilere nasil *destek* veriyorsunuz?
    - Dersinizi düsünürseniz, sizce bu destek yeterli geliyor muydu? Ögrencilerinizden istekler geliyor mu? Örnekler verebilir misiniz?
    - Sizce, daha neler yapilabilir?

- Programi *basarili* buluyor musunuz? Neden?
- Hem dersinizi hemde programi düsünürseniz, mevcut durumda ne gibi *eksikler* var? Örnekler verebilir misiniz?
- *Daha basarili ve memnun* ögrenciler yetistirmek için neler yapilmali?

APPENDIX D

INTERVIEW CITATIONS OF STUDENTS

[S-1]: Birkaç arkadasim var programda ve birbirimizle çok yakin degiliz.

[S-2]: Bir kaç kisiyle ne is yaptigi bu programi ne için kayit yaptirdigi hakkinda konustuk, ve muhabbetlerimiz çok yüzeyseldi.

[S-3]: Ödev yaparken, sinavlara çalisirken ve ders notlarinda takildigimiz yerlerde birbirimizle yardimlasarak çözülebiliriz.

[S-4]: Katilimcilar farkli sehirlerden geliyor, bu nedenle ilk gün yorgun olabiliyor. Ayrica, genellikle ilk gün iki derse katiliyorlar ve ikinci gün iki sinava. Bu sinavlara çalismak zorundalar. Bu nedenlerden, zaman kisitli yüzyüze derslerde ve katilimcilar digerleriyle iletisime geçmek yerine derslerle ilgilenmeyi tercih ediyorlar.

[S-5]: Yüzyüze derslerde, daha önce görmedigim kisilerle tanismayi denedim, fakat sohbet ve tartisma gruplarinda konusmustum.

[S-6]: Bazen sohbet araçlarina giriyordum fakat chat odalarinda kimse yoktu. Birileriyle ayni anda konusmak veya tartismak için, onunla yakin olmalisiniz ve e-mail yoluyla gireceginiz zamani kararlastirmalisiniz.

[S-7]: Iletisim belkide internet üzerinden bir egitim oldugun kopuyordur. Insanlarin ayni anda fiziksel olarak birlikte olmadigi ve beraber vakit geçirmedigi zaman insanlarin arasindaki iletisimi artirmasi zor.

[S-8]: Katilimcilar birbirlerini iyi tanimiyorlar, bu nedenle konusma çok kisa oluyor. Örnegin, Ben bazilariyla MSNde konusmayi deniyorum. Bazen onlara bugün programda neler yaptigini soruyorum, ve kendi yaptiklarimi anlatiyorum, fakat, kisa bir süre sonra, sohbetimiz bitiyor az aktivite paylastigimizdan.

[S-9]: Bence iletisim çok da gerekli degil online ders alirken veya kendi kendine çalisirken

[S-10]: 4-5 katilimci var ayni üniversite ögrenciler. Kendi aralarindaki iletisimleri iyi ve genellikle kendi aralarinda konusmayi tercih ediyorlar.

[S-11]: Etkilesimi artirmak katilimcilar arasinda bazi aktiviteler tasarlanabilir.Ayrica, grup çalismasi gerektiren aktiviteler tasarlanabilir ve ögretim üyeleri grup olusturmakta güçlük çekenlere yardim edebilir.

[S-12]: Soru sordugum zaman yardim etmeye çalisiyorlar. Mesala, mail attim ve kisa sürede cevap verdiler.

[S-13]: Tartisma grubuna genellikle ders ile ilgili konularda, örnegin ödevler, sinavlar gibi, mesajlar yazdim

[S-14]: Düzenli çalismama, konuyu ögrenirken zorlanma, ve öne çikan katilimcilar

[S-15]: Haftalik ders içerigi iyi tasarlanmis. Çok uzun veya çok kisa degil. Bütün hafta sikilmadan mesgul olmamizi sagliyor.

[S-16]: Web sitesindeki ders notlari özet olarak verilmis. Ders kitaplarina destek olmasi için tasarlandi. Haftalik ders konularinin üzerinden geçtikten sonra, kitaplardaki ilgili chapterlardan detayli bilgilere ulasmalari için tavsiyelerde bulunuyor. Bence bu yol bizim için uygun çünkü web sitesindeki notlardan konular hakkinda önbilgi edinmis oluyoruz, sonra, kitaplardan daha detayli ve complex yapilara okuyarada kendimizi gelistirebiliyoruz.

[S-17]: Yazilim mühendisligi dersinde birçok concept var. Birçogunu anlamadim ve aralarinda bir iliski kuramadim.

[S-18]: Baslarda ders notlarindan memnundum fakat ilerleyen derslerde çok çeviri yapilmis cümleler vardi.

[S-19]: Bence ilk iki ders iyi hazirlanmis. Ikinci dönemden itibaren problemler basladi. Üçüncü dönemde tamamen görülmeye baslandi ve son dönemde biz koptuk.

[S-20]: C ile bilgisayar programciligina giris dersinde basarliydim, takip eden ders olan veri yapilari ve algoritmalar dersinde de basarili olacagimi düsünüyordum ama olmadi.

[S-21]: Özellikle son derslerde daha fazla ön bilgiye ihtiyacimiz oldugunu düsünüyorum, fakat, bu program bize derslere katilacak kadar gerekli bilgileri saglamiyor.

[S-22]: Programa yaptigim ödemelerle ilgili faturaya ihtiyacim vardi. Bana kisa süre içinde gönderdiler. Buna ilaveten, chat esnasinda bir istegimi belirtmistim, hem hocalar hemde koordinatörler tarafindan kabul edildi.

[S-23]: Bireysel feedback özelliklede ödevlerimizin sonuçlari hakkinda saglanabilir. Ödevlerimizdeki hatalarimizi görmek istiyoruz.

[S-24]: Hocalar veya ilgili kisiler ödevlerini göndermeyenlerle veya chatlere katilmayanlarla iletisime geçebilir. Eger problem programdan kaynaklaniyor, çözüm için yardim edilinebilir.

[S-25]: Ders notlarini ögrenirken dinleyerek ve görerek ögrenmeyi okuyarak ögrenmeye tercih ederim. Özellikle, programlama derslerinde bilgisayar basina geçerek lablara katilarak, böylece dersler bana daha çok yarar sagliyor.

[S-26]: Bazen kafamdaki soramiyorum, çünkü, tartisma gruplarinda ve chat oturumlarinda konular geçmis oluyor.

[S-27]: Bir programlama dilinde iyi seviyede kod yazma seviyesine gelmek için derse katilmayi tercih ederdim. Örnegin C programlama diline 4-5 ay için.

APPENDIX E

INTERVIEW CITATIONS OF INSTRUCTORS

[I-1]: Tartisma gruplarini genellikle ögrencilerin direk sorularini sormalarina izin vermek için kullaniyoruz. Amacimiz, diger ögrencilerin bu sorulara cevap vermesi olanagi saglamak. Istedikleri zaman ögrenciler sorulari yönlendirebiliyorlar kisa bir süre bekledikten sonra kontrol ediyoruz diger ögrencilerin cevap verip vermediklerini ve tabi ki cevaplari kontrol ediyoruz. Eger diger ögrenciler dogru cevap vermis ise, müdahale etmiyoruz. Fakat yanlis bir cevap verilmis yada yanlis anlayacaklari bir cevap verilmis ise yazilanlari kibarca dogruluyoruz. Gruptan dogru cevap gelmesi için kisa bir süre bekliyoruz, belirli bir süre geçtikten sonra dogru cevabi listeye gönderiyoruz.

[I-2]: Chat oturumlarini genellikle tartisma esnasinda aninda sorduklari sorulari cevap vermek için kullaniyoruz. Tabi ki chat oturumlari manipule etmeye açik bir sey. Bunu söyle söyleyebilirim çünkü bazi konular ögrencilerin anlamasi için daha zor. Eger konunun ögrencilerin anlamasi için zor oldugunu düsünüyorsam, ilk olarak chat oturumu esnasinda ögrencilerden sorular gelmesini bekliyorum. Eger sorular konuyu açmak için yeterli degil ise, ben ögrencilere soru soruyorum. Tamam arkadaslar, bu hakkinda bahsettik. Anlasildi mi? Sorulariniz var mi? veya ders konulari hakkinda sorular soracagim ve böylece onlari yönlendirmeye çalisacagim. Ögrencilere bu tür sorular bir kez sordugumda, diger sorular bir birini takip ediyor ve bu yolla ögrencilerin konuyu uygun bir sekilde kavramasini saglamaya çalisiyoruz.

[I-3]: Online egitimde ders hazirlamak oldukça zor. Çok dikkat gerektiriyor. Aslinda, kitap hazirlamaya benzedigi yerler var. Fakat, ders materyalinde çesitli etkilesimler hazirlamaniz gerekiyor ve materyalimiz ögrencileri motive etmesi gerekiyor. Ama, bu kolay degil çünkü etkilesim online ortamlarda yüzyüze egitimle karsilastirildiginda daha kisitli. Online derslerde, çesitli metodlar bulmalisiniz etkilesimi artirmak ve ögrencilerin motivasyonunu artirmak için.

[I-4]: Bir kez materyali gelistirdikten sonra, gelecek yillardaki hazirlanma süre ilk yildan çok daha az ve ayrica dersi daha kolay verebilirsiniz.

[I-5]: Bizim ders materyallerimiz ders konulari hakkindaki temel bilgilerden olusuyor fakat biz referans kitaplariyla, online web sayfalariyla, dokumanlarla destek materyalleri sagliyoruz. Katilimcilar sagladigimiz destek materyallerini kolaylikla erisebilirler ve biz ders esnasinda bu materyallerden ilgili yerleri

okumalarini tavsiye ediyoruz. Böylece, daha detayli ders notlari hazirlamaya gerek duyulmuyor. Ayrica, ögrenciler birçok kaynagi inceleyerek ögrenebilirler.

[I-6]: Katilimcilar genellikle database dizayn etmeyi, tablo yaratmayi, quariler yazmayi dersimde seviyorlar çünkü katilimcilar derslerde bir seyler yapabildiklerini hissediyorlar.

[I-7]: Dersimde katilimcilar, özellikle bilgi seviyesi sinirli katilimcilar, için programlama mantigini kapmak zor.

[I-8]: Ders materyalleri tasarlarken ve gelistirirken finansal destege ve ögretim görevlilerine yardim edecek bir gruba ihtiyaç duyuyoruz.

[I-9]: Katilimcilardan beklentimiz, bizim bilgisayar mühendisligindeki ögrencilerimiz kadar basarili olmalaridir. Bilgisayar mühendisligi bölümündeki farklilar, bu online programda sekiz bilgisayar mühendisligi dersini dört dönemde toplam 9 ayda veriliyor. Her bir iki ders, takip eden iki ayda veriliyor. Her yeni dönemde yeni ve daha ilerlemis ders konulariyla karsi karsiya geliyorlar. Bazi katilimcilar bir önceki dönemdeki ders konularini tam özümsemeyebiliyorlar. Özellikle, self-disipline sahip olmayan katilimcilar zorlanabilirler. Bence online ögrenciler yüzyüze verilen ögrencilerden daha fazla çalismalilar ve ders notlarina bütün program boyunca düzenli çalismalilar.

[I-10]: Sistemimiz yeterli. Dersimizde, bir hoca ve bir asistanin ilgilendigi aktivitelerde herhangi bir problem yok. Su ana kadar ögrencilerin isteklerini yerine getirmedigimiz bir seyle karsilasmadik

[I-11]: Ders de, ögrencilerimizi sik sik takip edebilmek isterdim. Dönem sonlarinda yüzyüze verdigimiz sinavlar yerine, ders esnasinda bir projenin küçük parçalarini vererek ögrencileri evaluate etmek isterdim.

[I-12]: Basarili bir ders takibi için bir çok seyi takip etmek zorundayiz. Mesala, tartisma listesine atilan mesajlari takip etmek zorundayiz, chat oturumlarinda verimli tartisma ortami olusturmak zorundayiz, senkron ve asenkron araçlarini ayni zamanda kullanmak zorundayiz, dersin sonuna kadar ögrencilere düzenli guide etmek zorundayiz.

CURRICULUM VITAE

PERSONAL INFORMATION

Surname, Name: Yükseltürk, Erman
Date and Place of Birth: January 1978, Bolu
Phone: +90 312 210 55 34
e-mail: ermany@metu.edu.tr; eyukselturk@yahoo.com

EDUCATION

MS	Computer Education and Instructional Technology, Middle East Technical University, Ankara, Turkey	July,2003
BS	Computer Education and Instructional Technology, Middle East Technical University, Ankara, Turkey	June,2000

PROFESSIONAL EXPERIENCE

Research Assistant	Information Technologies Certificate Program (ITCP), (http://idea.metu.edu.tr) Department of Computer Engineering, Middle East Technical University, Ankara, Turkey	2000-
Computer Specialist	TED Ankara College, Ankara, Turkey	1999-2000

RESEARCH INTERESTS

Distance education, designing online learning environments, instructional design, online collaboration, instructional technology, teacher education.

SELECTED JOURNAL PUBLICATIONS

Yukselturk, E. & Bulut S. (2007) Predictors for Student Success in an Online Course, *Educational Technology & Society***,** 10(2), 71-83.

Yukselturk, E. & Cagiltay, K. (in press) Collaborative Work in Online Learning Environments: Critical Issues, Dynamics and Challenges, Publisher: Idea Group (Book Chapter)

Inan, F. A., Yukselturk E., & Grant, M. M. (in press). Profiling Potential Dropout Students by Individual Characteristics in an Online Certificate Program, *International Journal of Instructional Media*, 36 (2).

Yukselturk, E. & Top, E. (2006), Reconsidering Online Course Discussions: A Case Study, *Journal of Educational Technology Systems*, 34(3), page 341 - 367.

Yukselturk, E. & Inan, F.A. (2006). Examining the Factors Affecting Student Dropout in an Online Certificate Program, *Turkish Online Journal of Distance Education-TOJDE*, 7 (3). Retrieved May 9, 2007, from http://tojde.anadolu.edu.tr/

Yukselturk, E. & Bulut S. (2005) Relationships among Self-Regulated Learning Components, Motivational Beliefs and Computer Programming Achievement in an Online Learning Environment, *Mediterranean Journal of Educational Studies*, 10(1), page 91-112.

Yukselturk, E. (2005). Online Information Technologies Certificate Program, *Turkish Online Journal of Distance Education-TOJDE*, 6(1). Retrieved May 9, 2007, from http://tojde.anadolu.edu.tr/