STUDENTS' PERCEIVED EFFECTIVENESS OF AN ONLINE COURSE DELIVERED THROUGH A COURSE MANAGEMENT SYSTEM: THE CASE OF AN UNDERGRADUATE COURSE

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submitted by **NEŞE SEVIM** in partial fulfillment of the requirements for the degree of **Master of Science in Computer Education and Instructional Technology, Middle East Technical University** by,

Prof. Dr. Canan ÖZGEN _____
Dean, Graduate School of **Natural and Applied Sciences**

Prof. Dr. M. Yaşar ÖZDEN _____
Head of Department, **Computer Ed. and Inst. Tech.**

Dr. Hasan KARAASLAN _____
Supervisor, **Computer Ed. and Inst. Tech., METU**

Examining Committee Members

Assoc. Prof. Dr. Soner YILDIRIM _____
Computer Ed. and Inst. Tech., METU

Dr. Hasan KARAASLAN _____
Computer Ed. and Inst. Tech., METU

Assoc. Prof. Dr. Erdinç ÇAKIROĞLU _____
Elemantary Education, METU

Dr. Saniye Tuğba BULU _____
Computer Ed. and Inst. Tech., METU

Dr. Cengiz Savaş AŞKUN _____
Computer Ed. and Inst. Tech., METU

Date: 28.05.2009

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 : Neşe Sevim

Signature :

ABSTRACT

STUDENTS' PERCEIVED EFFECTIVENESS OF AN ONLINE COURSE DELIVERED THROUGH A COURSE MANAGEMENT SYSTEM: THE CASE OF AN UNDERGRADUATE COURSE

Sevim, Neşe

M.S., Department of Computer Education and Instructional Technology

Superviser: Dr. Hasan Karaaslan

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This study analyzed students' perceived effectiveness of an online course delivered through one of the open source course content management system, Moodle. Students' expectations, perception, comments and suggestions about Moodle were investigated in this study.

This is a case study carried out 49 students who attended to CEIT321 Foundation of Distance Education course in summer school in 2008 and 29 students who attended to the same course in fall semester of 2008-2009 academic year at Computer Education and Instructional Technology at Middle East Technical University. Blended learning that combines face-to-face interaction and online learning was used in the course.

In this study, the qualitative and quantitative data were gathered from the students attended to the study. The questionnaire was distributed to the participants at the end

of the summer school and fall semester. In addition, interviews with the volunteer participants were conducted in order to understand students' perceptions, thoughts, expectations, recommendations, and comments on Moodle and its applications. The data showed that students had positive attitudes towards Moodle and its application.

This study can contribute the future research studies related with Moodle. Moreover, the results of this study can contribute the development of Moodle.

Keywords: Blended learning, Moodle, web-based instruction, e-learning.

ÖZ

BİR DERS YÖNETİM SİSTEMİ ARACILIĞI İLE VERİLEN ÇEVRİMİÇİ DERSİN ETKİLİLİĞİ KONUSUNDA ÖĞRENCİLERİN ALGILARI: BİR LİSANS DERSİ DURUMU ÇALIŞMASI

Sevim, Neşe

Yüksek Lisans, Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü

Tez Yöneticisi: Dr. Hasan Karaaslan.

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Bu çalışmada öğrencilerin açık kaynaklı bir ders yönetimi sistemi aracı olan Moodle ile verilen çevrimiçi dersin etkililiği konusunda öğrencilerin algıları analiz edilmiştir. Bu çalışmada öğrencilerin Moodle hakkındaki beklentileri, algıları, görüşleri, yorumları ve tavsiyeleri incelenmiştir.

Bu çalışma bir durum çalışmasıdır ve 2008 yaz okulunda ve 2008-2009 öğretim yılının ilk döneminde Orta Doğu Teknik Üniversitesi Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü' nde okutulan CEIT 321 Uzaktan Eğitimin Temelleri dersine katılan 49 öğrenci ile gerçekleştirilmiştir.

Bu çalışmada, çalışmaya katılan öğrencilerden nitel ve nicel veriler toplanmıştır. Yaz okulu sonunda ve ilk dönemin sonunda öğrencilere anket uygulanmıştır. Ayrıca, gönüllü öğrencilerle öğrencilerin Moodle ve birleşenleri hakkında algıları, düşüncelerini, beklentilerini, tavsiyelerini, yorumlarını anlamak için röportaj

yapılmıştır. Elde edilen veriler öğrencilerin Moodle ve birleşenleri ile ilgili pozitif tutumları olduğunu göstermiştir.

Bu çalışma bundan sonra Moodle hakkında yapılacak çalışmalara katkıda bulunabilir. Ayrıca, bu çalışmadan elde edilen veriler Moodle aracının geliştirilmesinde kullanılabilir.

Anahtar Kelimeler: Harmanlanmış Eğitim, Web-Tabanlı Öğretim, E-Öğrenme

To my Family

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CHAPTER 1

INTRODUCTION

1.1 Background of the Study

As Atatürk pointed out, education is the most important and critical issue. It makes the nation independent, glorious, and honorable or it leaves them miserable and slaves (Feyzioğlu, 2008).

In Turkey, there are large numbers of students who ask for higher education. In 2006, 1,678,000 students took university entrance exam. Only small portion of this number can access higher education. The universities in Turkey try to accept as many students as possible however; such high demand cannot be met without open distance education.

Distance learning is seen as alternative methods to traditional learning. It can deliver the necessary access and cost efficiencies (Latchewn, Özkul, Aydin, & Mutlu, 2006). With the improvement of technology, it offers the same features of traditional learning environment. Today, distance learning has become less expensive, more accessible, and possibly even preferred among some learners (Graham, 2002).

Online learning course websites are becoming more popular as people understand the advantages of online learning. It links the students and instructor more closely and allows them to form online communities (Chang & Tung, 2008). Many organizations use internet and the World Wide Web to help student to access supplemental and/or complementary course-related material (Snow, Pullen, & McAndrews, 2005). Academic institution prefers open source application to deliver e-learning. The ratio

of implementing open-source applications is about 57% of all U.S instuitions (Leung & Li, 2007).

1.2 Statement of the Problem

With the improvement of the technology, many tools and media come into existence into the educational life. New technological media allows instructors to give more effective online courses. Multimedia and computer network made learning easier and more convenient to use (Chang & Tung, 2008). World Wide Web provides opportunities for instructors to create well-designed, learner-centered, engaging, interactive, affordable, efficient, easily accessible, flexible, meaningful, distributed and facilitated learning environments (Khan, 2001). In addition, e-learning provide opportunities to improve teaching and learning process (Govindasamy, 2002). It is available, and offers training at anytime and anywhere to anyone. It offers training to the right person with competent technical ability or knowledge at the right time (Chang & Tung, 2008).

Web-based Learning Environments supported by the Course Content Management Systems (CCMS) have become solutions for institutions, schools and universities that want to offer e-learning or supported blended-learning activities (Botturi, Mazza, & Tardini, 2007). Moodle can be given as an example for those course content management systems. It is open source and it is preferred by most of the universities especially North American and European universities. It has a large diverse user community. More than 50,000 users from 120 countries registered to Moodle. (Beatty & Ulasewicz, 2006).

Although Moodle is becoming more popular across the universities, the effectiveness of Moodle from students' perspectives was not analyzed deeply. The main assumption of this study is that without knowing what problems students face when they use Moodle or other course management programs or the perceptions of the

students towards these kinds of programs, it is very difficult to build effective online learning communities. For this reason, there is a need to investigate the students' perception towards Moodle program to take the advantages of online learning.

1.3 Purpose of the Study

The purpose of the study is to analyze the effectiveness of the Moodle program in blended learning environment blended online learning and traditional learning. The researcher tries to illustrate the effectiveness of Moodle from the students' perspectives.

The study addressed the following specific research questions;

- What are the students' perceptions about the effectiveness of Moodle in online learning environment?

    a) What are the students' perceptions about communication through Moodle?

    b) What are the students' perceptions about user interface, ease of access, user control, freedom in the Moodle?

    c) What are the students' perception about diagnose, recover from errors in Moodle?

    d)What are the students' perception of Moodle and its applications?

1.4 Significance of the Study

Moodle is a Course Content Management System which is designed by the educators and programmers in order to help educators to create effective online learning environments. Moreover, the features of the Moodle allow the students for

collaborate working. This platform helps the instructor to manage the content of the course more effectively. In addition, it offers a large variety of resources and activities such as quizzes, diaries, wiki, and glossary to the students.

Although, most of the universities, schools and institutions prefer Moodle to deliver online education, the Moodle program as a Course Content Management System are not analyzed deeply. Many researchers have been conducted related with the open source software especially Moodle. However, those researches compare the Moodle with other course management systems. The effectiveness of Moodle from the students' perspectives has not been investigated. Even though Moodle is designed by both the educators and programmers, the perception of students' to Moodle should be taken into consideration since it is the main medium that students use in their learning process.

The findings of the study help to incorporate Moodle attributes into the design of effective web-based learning environments.

1.5 Definition of Terms:

Traditional Education: Instructional interactions in which the students and the instructor meet in a specific place at specific time in order to achieve specific goals.

Distance Education: Instructional interactions in which the teacher and learners are separated by time, space or distance (Driscoll & Carliner, 2005).

E-learning: Any instruction giving by electronic means such as computers.

Web based instruction: A hypermedia-based instructional program which uses the Web as the medium for delivering instruction to a remote audience by utilizing the attributes and resources of the World Wide Web (Khan, 2001).

Blended Learning: A learning method that combines the traditional learning and online learning.

CHAPTER 2

LITERATURE REVIEW

In this chapter, literature related with the Distance Education, E-learning, Web Based Instruction, Blended Learning, Constructivism, Open Source Software, Course Content Management Systems, and Moodle are reviewed.

2.1 Distance education

According to Harting and Erthal (2005) distance education is structural learning in which the student and instructor are separated by time and place. Perraton (1988) defines distance education as "an educational process in which a significant proportion of the teaching is conducted by someone removed in space and/or time form the learner " (p.34).

Distance education has a history over than 150 year. In the past most of the instructors used traditional learning methods. In these methods, the master and the students came into a specific place at specific time in order to learn from the master. However, there was a problem related with the method. In this traditional learning method, not all the people had equal chances to attend the class regularly. This situation forced the educators to search for alternative learning methods (Gunawardena & McIsaac, 2003). With the help of the new technologies and the evaluation of systems for delivering information, distance education provides equality accesses to education (Schlosser & Anderson, 1994). Today dozens of public and private organizations and instuitions offers distance education to schools, universities, the military and large cooperations (Gunawardena & McIsaac, 2003).

Keegan (1980 cited in McIsaac & Gunawardena, 2003) identified six key elements of distance education in terms of teacher and learner separation, the influence of an educational organization, usage of media in order to link the teacher and learner,

two-way exchange of communication, learners as individuals rather than groups, and education as an industrialized form.

Since there is a separation between the students and instructors in distance education, they can only communicate each other with the help of media. For this reason, media is the primary rather than secondary materials for learning in distance learning environments (Gunawardena & McIsaac, 2003). At the beginning, the main media used in distance education was printed and written materials. But with the development of technology, new media such as broadcast radio, televisions and microwave, teleconferencing, computers have integrated to the distance education environment (Harting & Erthal, 2005).

To be effective, distance education should focus on the needs of the learners, the content requirements and the constraints that learner faces (Harting & Erthal, 2005) . The success of distance education depends on careful planning on division of labor basis, costly development, and objectification through media (Peters, 1998).

2.1.1 Theoretical Developments of Distance Education

2.1.1.1 The Industrial Model of Distance Education

The industrial production model of distance education is proposed by Otto Peters. According to Peters, the distance education allows to reach huge number of audience by using technology. For this reason, it creates industry out of learning. It is consistent with industrial principles and tendencies, and characterized by rationalizing, division of work between people, planning, mechanizing, organization, production-line work and mass production (Schlosser & Anderson, 1994). However, most of the educationalist opposed to this model. They state that this model is not a teaching or learning theory. In fact, according to them, it is just an organizational theory and it only explains the organization of the educational process (Gunawardena & McIsaac, 2003).

2.1.1.2 Transactional Distance

Moore (1993) defines the transactional distance as a psychological or communications gap between the learner and the instructor. He states that transactional distance is not determined by geographical distance. In fact, according to him it is determined by the amount of conversation between the learner and the instructor and the amount of structure that exits in the design of the course. Due to the reason, he adds that transactional distance exits in all educational relationships and can influence students' motivation, participation, and engagement with learning.

Moore (1993) put great emphasize on learner autonomy in his transactional distance theory. According to him, if the learner has capacity and desire to modify his/her own learning process; there will be equivalent decrease in the degree of instructor control over the students' learning process. For this reason, Moore categorizes the educational programs based on the degree of autonomy they offer the learners in terms of planning, implementation and evaluation of instruction.

Moore (1993) proposed guidelines to overcome the transactional distance problem. He states that educationalist have to find opportunities to increase the students-instructor dialogue and decrease the structure of the educational program. He emphasizes that when an educational program has more structure and less student-teacher dialogue, greater transactional distance occurs; however if learner control and dialogue increase, transactional distance decreases.

2.1.1.3 Interaction

Interaction is one of the key features in the learning process of the students (Tu, 2000 cited in Driscoll & Carliner, 2005). Navarro and Shoemaker (2000) states that the level of interaction affects the quality of the learning experience. In the surveys, it is found that higher levels of interaction increase achievement (Kekkonen-Moneta & Moneta, 2002) and positive learning attitudes (Althaus, 1997).

Moore (1989) discusses three types of interaction that are essential in distance education.

Learner-Content Interaction: In this interaction, students obtain intellectual information from the material (Moore, 1989). The learner reflects on the content and questions the material in order to analyze, synthesize, and evaluate it (Driscoll & Carliner, 2005).

Learner-Instructor Interaction: The main difference between learner-instructor interaction and the learner-content interaction is that the instructor can give feedback to students about their new knowledge and assess their understanding in learner-instructor interaction (Driscoll & Carliner, 2005). It includes motivation, feedback and dialogue between the teacher and student (Moore, 1989).

Learner-Learner Interaction: In this interaction, students attending the same course exchange the information, their ideas with each other (Moore, 1989).

Hillman, Willis and Gunawardena (1994) add the fourth interaction occurred in distance education to Moore's interaction model. They state that there is an interaction between the learner and the technology that delivers instruction. According to them, this instruction is critical component of the model. For this reason, instruction designers must include learner-interface interactions and give opportunities to learner to have successful interactions with the technology.

Learner-technology interaction took the educationalist attention and made research related with it. Yacci (2000) analyze the interaction in the online learning environments between the computers and learners and claim that there are three ways learners interact with computers. Learners can learn through computers, learn from computers and learn with computers.

Learn through computers: This includes strategies related with how students use computers to get information. The strategies in this group are about using content

and information without a facilitator. It is self-directed learning in which students prepare, organize, execute and evaluate projects without the assistance of a facilitator.

Learn from computers: This includes strategies related with how learners use the computer as a tutor or guide. In this interaction, the students generally study the content on their own pace and master the predefined skills and knowledge. The most common learning philosophy for the strategies used in this group is behaviorism (Driscoll & Carliner, 2005). These strategies are best for teaching lower- level skills such as knowledge, comprehension and application.

Learn with computers: According to Jonassen, Carr, and Hsiu-Ping (1998), mind tools are in this group. This includes strategies that students use computers to do basic task such as calculating or organizing when they deal with high order skills such as evaluation.

2.1.1.4 Control

Control is the opportunity and ability to influence the educational transaction (Gunawardena & McIsaac, 2003). According to Baynton (1992, citied in Gunawardena, McIsaac, 2003), control of the learning process is caused by three essential dimension in terms of independence (the opportunity to make choices), competence (ability and skill) and support (both human and nonhuman resources).

2.1.1.5 Social Presence

Short, Williams & Christie (1976 cited in Richardson, 2003) define social presence as "the degree of salience of the other person in the (mediated) interaction and the consequent salience of the interpersonal relationships". According to them, the degree of social presence varies among different media and it affects the nature of conversation.

Social presence is one of the most important factors that affect the instructional quality and it is a strong predictor of satisfaction within computer mediated communication (Tu, 2002). In the researches it is found that cues given to students such as encouraging gestures, smiles, and praise are social factors that affect students' satisfaction and their perception of learning (Gunawardena & McIsaac, 2003). For this reason, especially in online learning students are allowed to use avatars or gestures in order to show their social existence in the educational environment.

2.1.1.6 Independence and Autonomy

Wedemeyer (1981 cited in Gunawerdena & McIssac, 2003) shifted the focus of distance education from organizational and administrative concerns to the educational issues concerning learning at distance. He put great emphasis on independent learning in distance education. He describes the essential elements of distance learning in terms of greater students' responsibility, widely available instruction, effective mix of media and methods, adaptation to the individual differences, wide variety of start, stop and learn times. He believes that the key factor of distance education is the development of the relationship between student and tutor (in Schlosser & Anderson, 1994).

Moore (1970 cited in Schlosser & Anderson, 1994) emphasizes the learner autonomy in distance education environment. He states that in traditional learning environments, the learners are dependent on teachers for guidance. Moreover, according to him, in most of the programs teachers are active whereas the students are passive. However, in distance education there is a gap between the learner and instructor so that the learner has to have high degree of responsibility in their learning process (Keegan, 1986 cited in Schlosser & Anderson, 1994).

2.1.1.7 Guided Didactic Conversation

Guided didactic conversation refers to both real and simulated conversations existed in the educational area. It is the concept proposed by Holmberg (Gunawerdena, McIssac, 2003). According to Holmberg, this theory "has an explanatory value in relating the teaching effectiveness to the impact of feelings of belonging and cooperation as well as to the actual exchange of questions, answers and arguments in mediated communication" (Schlosser & Anderson, p.11).

2.2 E-learning

There are various definitions of e-learning in the literature. Clark and Mayer (2002, p.13) define e-learning as "an instruction delivered on a computer by way of CD-ROM, internet or intranet with the following features;

- Includes content relevant to the learning objective
- Uses instructional methods such as examples and practice to help learning
- Uses media elements such as words and pictures to deliver the content and methods
- Build new knowledge and skills linked to individual learning goals or to improved organizational performance" (p.2).

Garrison & Anderson (2003) defines e-learning as "... networked, on-line learning that takes place in a formal context and uses a range of multimedia technologies." According to Zahner (2002) "E-learning is an extension of the traditional courses, classes or training sessions to the desktop where learning opportunities can be provided in asynchronous, self-paced formats or in synchronous virtual classes." (p.12)

Clark and Mayer (2002) define three types of e-learning, learning as information acquisition, learning as response strengthening, and learning as knowledge construction.

Learning as information acquisition: In this e-learning it is aimed to add information to learner's memory. For this reason, in these e-learning courses students are presented as much information as possible.

Learning as response strengthening: Directive or "show and do" courses can be given as examples for this type of e-learning. These e-learning courses try to strengthen or weaken associations between a stimulus and response.

Learning as Knowledge Construction: In this type of e-learning it is assumed that learning occurs when a learner builds coherent mental representation. These types of courses are most affective for far transfer performance goals. Students are presented the guidelines in the training and they are expected to adapt these guidelines to unpredictable situations on the job.

There are various advantages of e-learning. Firstly, it provides opportunities for students to get higher education and it proposes flexible scheduling of personal time, convenient location, and individualized attention by the instructor. Moreover, it allows students to have more time to think about and respond to question posed by instructor. It also brings benefits to intuitions offering e-learning. It increases enrollment, attracts more qualified students, increase retention and graduation rates and increases institutional prestige. Finally, e-learning allows instructor freedom to be more creative in the classroom, reduces the need of buildings. Despite the benefits, online learning also brings disadvantages. First of all, it can be expensive to create an efficient learning environment that supports the learning process of students. Secondly, intuitions have to train the staffs who give online learning and the appropriate and affective educational materials have to be developed. Inadequate infrastructure, technical support and technology limitations also cause problems in online learning. And finally, because of differences in culture, the content of the educational materials, the values implicit in the materials, and the underlying assumptions about educational processes need to be analyzed deeply and might need

to be transformed (Discenza, Howard, & Schenk, 2002).

There is a difference in the design principle of e-learning course and traditional classroom lectures (Driscoll & Carliner, 2005). According to Hawkridge (2002) in the design process of web sites used in e-learning, the designer should consider;

- The students who will use the web site
- The structure of knowledge in that field
- The objectives of the course
- The capabilities of the software
- Graphic design
- Means of making the site interactive
- Evaluation criteria.

Clark and Mayer (2002) identify three different approaches that are used in the design process of e-learning in terms of receptive, directive and guided discovery.

Receptive learning: This approach is based on transmission models of instruction. The aim of this approach is providing and informing source of information. The learning environments that are designed by this approach lack external interaction opportunities.

In these environments, learners are presented with the content and it is assumed that they convert the knowledge into useful new knowledge and/or skills. The students are presented information, and they are motivated and/or communicated basic knowledge.

Directive learning: This approach is based on the behaviorist learning theory. The e-learning environments designed by this approach aim to strengthen or weaken the association between stimulus and response. These courses can be called as directive or "show and do" courses. In these courses, students are presented the small chunks of content, examples, demonstrations followed by practice with. In this approach, the

main duty of the instructors is providing short content segments followed by questions and providing immediate corrective feedback. The learners' job is to respond accurately to the questions and revise their answers based on the feedback. Drill and practice is a useful instructional method for this approach. The e-learning courses based on this approach are mostly aimed to develop procedural or near-transfer skills.

Guided Discovery: This approach is based on the constructivist learning theory. In e-learning courses designed by this approach, the main duty of the instructors is serving as a cognitive guide. The learners' job is to make sense of the presented material often in the context of solving job related problem. This type of e-learning is most affective for far transfer performance goals, in which the guidelines presented in the training, will need to be adapted to unpredictable situations on the job.

Clark and Mayer (2002) identify three potentially instructional methods which are unique to e- learning;

- Practice with automated feedback
- Integration of collaboration with self-study
- The use of simulation to improve expertise.

In addition to these, they identify the pitfalls of e-learning as;

- Transfer caused by inadequate job analysis
- Failure to accommodate human learning limits and strengths
- High attrition rates.

To overcome these pitfalls of e-learning, they suggest that, the designer must hold in-depth job and task analysis and choose the appropriate instructional methods that will both accommodate human psychological process and exploit the capabilities of technology. In addition, individuals need to have individual discipline and commitment in a world full of competing alternatives for worker time and attention.

2.3 Web-Based Instruction

Khan (1997) defines Web based instructions (WBI) as "an innovative approach for delivering instruction to a remote audience, using the web as the medium" (p.1). In addition to this definition, he also explains WBI as hypermedia–based instructional program that is used to create a meaningful learning environment. He states that it aims to support learning process by using the attributes and resources of the World Wide Web.

The characteristics of Web-based instruction are proposed by Driscoll (1998) and Khan (1997). Driscoll listed several principles of effective Web-based training. She explains that WBI should include multimedia (e.g., text, graphics, video, sound, and animation), easy-to-use graphic user interface (e.g., hyperlinks and navigation), attention to education details (e.g., clear guidance and direction for each lesson, clear objectives, adequate practice, and meaningful feedback), attention to technical details (e.g., free of "bugs" and the links to other Web sites work), and interaction.

The components of Web-based instruction suggested by Khan (1997) were similar to the principles proposed by Driscoll (1998). He includes synchronous and asynchronous communications tools and search engines in addition to components that Driscoll identifies.

According to Khan (2001), WBI features can be divided into two categories; key features and additional features. Key features are inseparable from the Web and related with the Web design issues. They are essential in the Web lessons. However, additional features are used to increase the quality and sophistication of the web design and their effectiveness is largely dependent on the key features. Their effectiveness is determined by analyzing how well the key features are integrated to design of the Web. Khan (2001) explains the key features and additional features by giving the following;

Key features: Interactive, multimedial, open system, online search, device-distant-time, independent, globally accessible, electronic publishing, uniformity, world-wide web, online resources, distributed, cross cultural interaction, multiple expertise, industry supported, learner controlled.

Additional features: Convenient, self contained, eased of use, online support, authentic, course security, environmentally friendly, non discriminatory, cost effective, ease of coursework development and maintenance, collaborative learning, formal and informal environments, online evaluation, virtual cultures.

2.4 Blended Learning

Driscoll and Carliner (2005) define blended learning as the combination of learning programs in different formats in order to achieve a common goal. However, according to Rossett, Douglis, and Frazee (2003) blended learning environments can also combine the materials in other formats. In their surveys, they observed that in blended learning environments anything could be blended. It can blend classroom and e-learning, two or more types of e-learning, or two or more types of off-line learning. But they suggest that blended learning programs should combine material presented from the traditional classroom, live virtual classroom, and asynchronous instruction.

Osguthorpe and Graham (2003) claim that there are at least three elements that can be mixed together in blended courses in terms of;

- Blending online and face-to-face learning activities
- Blending online and face-to-face students
- Blending online and face-to-face instructors.

They proposed a model that describes the combination and variation of these three elements. The following figure illustrates their model.

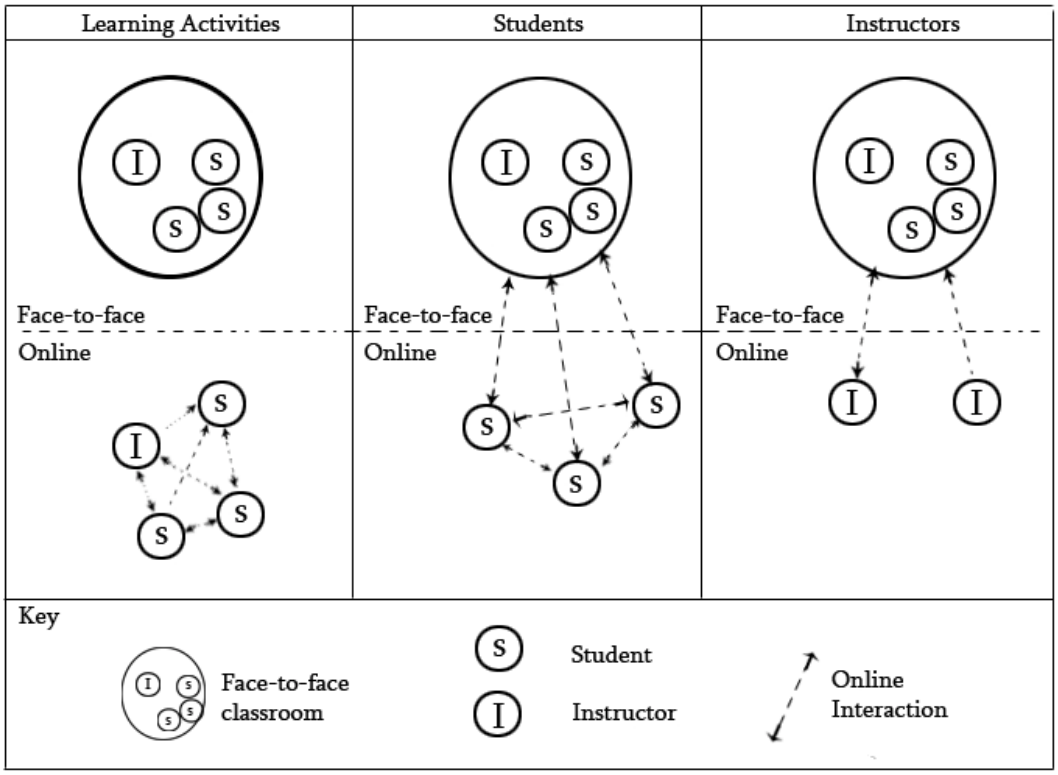

Figure 2.1: Common types of blended environments (Osguthorpe & Graham, 2003).

This figure shows how students can participate in face-to-face learning activities and online activities. In the first blending model in the figure, learners participate the face-to-face learning activities than they attend online activities. In the second model, students both attend to face-to-face and online learning activities. In the last model, the blended course is given students by both face-to-face instructors and online instructors to enhance the learning experiences of the students (Osguthorpe & Graham, 2003).

Carman (2005) states that there are five important elements of blended learning: live events, online content, collaboration, assessment and reference materials. Live events are synchronous, instructor led learning events. In these events all the learners of the course participate at the same times. Online contents are learner experiences that the

learners complete individually. They complete the content at their own speed and own time. Collaboration means the communication of learners with others by using chats, forums etc. Assessments are the measure of the learners' knowledge. Reference materials are materials that help the students to improve their learning and transfer the knowledge.

According to Osguthorpe and Graham (2003) blended learning environments combine the benefits of face-to-face interaction (both among learners and between learner and instructor) and online methods. In other words, the aim of using blended learning approaches is to form a harmonious balance which improves student learning between online access to knowledge and face-to-face human interaction. They state that in order to achieve this balance, instructor may vary the amount of face-to-face interaction and online methods. The instructor should consider the needs of every course and strengths and weakness of both traditional instruction and online teaching methods when they design a blended course. The following figure demonstrates different learning environment in order to increase the quality of education.

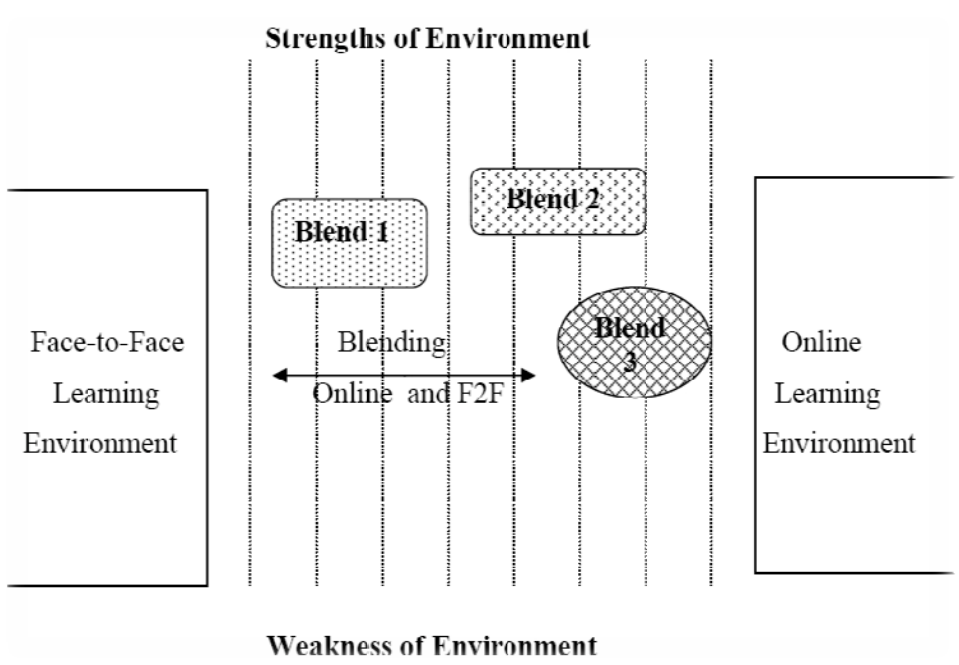

Figure 2.2: Blending the Strengths of Face-to-Face and Online Learning Environment (Osguthorpe & Graham, 2003)

In this figure three different blended learning environments are demonstrated. These environments have different strengths. According to this figure, Blend1 represents significant amount of synchronous interaction. The blend2 demonstrates asynchronous student-to-student interactions. Finally blend3 represents a course that combines the face-to-face and online approaches with a few weakness of each (Osguthorpe & Graham, 2003).

Blended learning has become popular among the professionals. They think that blended learning provides for a more effective learning experience (Driscoll & Carliner, 2005).

Marsh (2001) identifies the benefits of blended learning. According to her, blended learning takes the best from self-paced, instructor-led, distance and classroom

delivery in order to improve the quality of instruction. In other words, blended learning offers these benefits:

- Blended learning allows designers to separate prerequisite material from the rest of a course.
- Blended learning allows instructional designers to divide the content into rote content and critical thinking skills. Rote content focuses on lower-order thinking skills and it can be easily taught online. On the other hand, critical thinking skills can be stressed in the classroom environment.
- Blended learning allows designers to design learning content which includes the needs of different audience.
- Blended learning can help the employers to reduce the time spending on the training and minimize time away from the job for training.

Osguthorpe and Graham (2003) identified six main goals that can be taken into account by the instructors when they design blended learning environments in terms of pedagogical richness, access to knowledge, social interaction, personal agency and cost effectiveness.

2.5 Constructivism

Constructivism is a theory which is based on the assumption that people creates meaning instead of acquiring it (Ertmer & Newby, 1993). In constructivism, learners get knowledge by creating meaning from experiences (Bednar, Cunningham, Duffy, & Perry, 1992). Brooks (1990) states that better learning occurs when learners construct their knowledge based on situated construction of reality. He stated that constructivism support the students to construct their knowledge though social negotiation not by competition among themselves. For all this attributes of constructivism, Jonassen, Carr and Hsiu-Ping states that learning with technology in effective and efficient way require constructivist learning context.

Cobb (1994 cited in Bonk & Cunningham, 1998) identified two types of constructivism; cognitive constructivism and social constructivism. Cognitive constructivism is based on Piaget ideas. It focuses on construction of knowledge by the interaction with the environment. Cognitive constructivists try to make learning more relevant, building on student prior knowledge, posing dictions and addressing misconnections. On the other hand, social constructivism is based on Vygotsky ideas and it focuses on construction of knowledge in the sociocultural context within which we are all immersed. Social constructivists emphasize on human dialogue, interaction, negotiation, and collaboration.

Duffy and Cunningham (1996) claim that constructivist learning environments are characterized by seven pedagogical goals. According to them, constructivist learning environments;

- Provide experience for the students in their knowledge construction process
- Provide experiences that includes multiple perspectives
- Provide realistic and relevant contexts
- Encourage ownership in the learning process
- Provide opportunities for learning through social experience
- Provide multiple modes of representation
- Encourage self-awareness during the knowledge construction process

In addition to Cunningham and Duffy, Jonassen (1994) defines the characteristics of constructivist learning environments in terms of;

- Include multiple representations of reality that shows the complexity of the real world in the learning environment.
- Provide opportunities for knowledge construction rather than knowledge reproduction.
- Provide authentic tasks (real-world tasks) in a meaningful context instead of abstract instruction out of context.

- Provide learning environments based on real-world settings or case-based learning instead of predetermined sequences of instruction.
- Provide opportunities for students to reflect on experience thoughtfully.
- Provide opportunities for students to construct context- and content-dependent knowledge.

Lebow (1993) proposed five principles which are needed in the constructivist learning environment. These principles are;

- Provide the balance with the learners and the potentially damaging effects of instructional practices
- Provide context to students for learning that supports both learners' autonomy and relatedness
- Provide reasons of learning in the learning activity
- Provide self-regulated learning by promoting skills and attitudes which increase the responsibility of the learner for the developmental restructuring process
- Increase the motivation of learners to engage in intentional learning processes, especially by encouraging the error exploration.

According to Bednar, Cunningham, Duffy and Perry (1992), constructivism is not a set of design procedures. Instead, it is a way of looking at education and learning. However, they state that only a few writers try to offer general design procedures in order to build an affective constructivist learning environments.

Vanden (1998) is one of the educationalists who try to find general design procedures. He suggests five guiding principles. He says that course designers should

- Expect little knowledge by subject matter specialists
- Provide learning experiences in real-world context
- Design learning environments that includes multiple perspectives on reality
- Be aware of the importance of collaboration, dialogue, and debate in

knowledge construction process

- Provide opportunities for learners to demonstrate their ability work with the content and defend their judgments.

2.6 Open Source Software and Course Management Systems

Richard Stallman founded the Free Software Foundation in 1983 (Hars & Ou, 2002). However, people have confusion about the term “Free”. “Free” does not refer the freedom, it means the software distributed freely at no cost. For this reason, the term Open Source was introduced in 1998 (Raymond, 1998) .

There are some rules to call a program as Open Source software. First of all, the source code of the Open Source software must be freely available to its users. The source code must be given to the users in the distribution or users have to be provided well-publicized method of obtaining the source code. Moreover, derived works and modifications to the software must be allowed. Secondly, the software must be freely distributed and the license must not be specific to a product or not restrict other software and be technology-neutral (Berg, 2005).

Since open source software is distributed freely, educators decide to use them in educational area. For this purpose, open source Course Content Management Systems (CCMS) came into existence. The main advantage of the CCMS is that they are designed by the educators so that they are seen as effective tools in learning process (Flood, 2007). These tools help educators to build communities of learners and construct community of knowledge using web-based templates. (Gunawardena & McIsaac, 2003). Most of the schools, companies use CCMS technologies for their educational purposes.

Today, there are lots of open source course management tools designed by educators to help tutors giving the lecture or presenting the course materials online. Moodle can be given as an example for these kinds of course content management systems.

2.7 Moodle

Moodle is open source course content management system software which is aimed to help educators to create collaborative, interactive learning environment in order to support their classroom courses (Maikish, 2006). The verb Moodle stands for "Modular Object-Oriented Dynamic Learning Environment". Besides, it describes "the process of lazily meandering through something, doing things as it occurs to you to do them, an enjoyable tinkering that often leads to insight and creativity" (Cole & Foster, 2007). According to Buddie (2006), traditional learning approaches cause ineffective learning since they enhance passive transfer of knowledge from master to learner. However, Moodle provides an environment that allows the tutor to create core resources and activities which guide the students. He stated that many schools prefer Moodle due to plethora of activities it provides (Tuzi, 2007).

Moodle was created by Martin Dougiamas who has postgraduate degrees in Computer Science and Education. It has over 100 gradable activity modules and plugins (Tuzi, 2007) and designed based on a social constructivist theory. For this reason, it is learning-centered while most of the course content management systems are tool-centered. It offers a range of software modules and several features that help tutors to create online courses (Cole & Foster, 2007). Wiki, quiz, assignments, glossaries, and chats can be given as example to these features.

Additionally, it addresses the need for pedagogical support. It helps the tutor to create constructivist student-centered learning environments where students learn from his or her own experiences (Monahan, McArdle, & Bertolotto, 2008).

Moodle offers 70 language options and each site of Moodle can host 200,000 students (Moodle, 2008). Due to all these reasons, more than 30,000 educational organizations around the world currently use Moodle in order to deliver online courses or support traditional face-to-face courses (Monahan, McArdle, & Bertolotto, 2008).

CHAPTER 3

METHOD

In this chapter, the research questions, the design and participants of the study, general information about the course and course web site, data collection, data analysis procedures, assumptions and limitations of the researches are presented in order.

3.1 Research Questions

The main goal of this study is to understand the students' attitudes about one of the open source course content management system, Moodle.

This study was designed to answer the following specific research questions to reach the desired goals:

- What are the students' perceptions about the effectiveness of Moodle in online learning environment?

    a) What are the students' perceptions about communication through Moodle?

    b) What are the students' perceptions about user interface, ease of access, user control, freedom in the Moodle?

    c) What are the students' perception about diagnose, recover from errors in Moodle?

    d)What are the students' perception of Moodle and its applications?

3.2 Overall Design of the Study

This is a descriptive study with follow up. The purpose of this study is to gather reliable data which help the researcher to make a meaningful interpretation about the students' perceptions with respect to one of the open source course management programs, Moodle.

This study is a case study since the focus is on the course CEIT 321 Foundations of Distance Education which is given both in summer and fall semester of year in the department of Computer Education and Instructional Technology at Middle East Technical University. According to Yin (2003) case study is empirical inquiry which searches existing event within its real life context and it is used when the boundaries between phenomenon and context are not clear. The main goal of the case study is to understand the interaction between the event and case or multiple cases (in Randolph, 2008).

In this case study, both qualitative and quantitative data was collected. To collect quantitative data, the students enrolled CEIT 321 course in 2008 summer school or fall semester of 2008-2009 academic year were given a questionnaire. With the help of this questionnaire, it was aimed to drawn general picture about the students' perception about Moodle. The questionnaire was administered individually to the groups of participants due to many reasons. First of all, as stated by Best and Khan (1993) it allows the researcher to explain the purpose of the study and the items in the questionnaire to the participants in more detailed way. Moreover, it prevents time consuming and provides a high proportion of usable responses (Best & Khan, 1993).

After quantitative data collection, the qualitative data was obtained to support the findings gathered from quantitative data and get deep understanding about students' perception Moodle. Semi-structured interview technique was used in the study.

3.3 Participants of the Study

The participants of the study were Middle East Technical University (METU) students who enrolled CEIT 321 Foundations of Distance Education course given in both summer school during 2008 and fall semester of 2008/2009 in the department of Computer Education and Instructional Technology (CEIT) at METU.

The total number of students who were enrolled CEIT 321 course in summer school was 49. There were 14 female students and 35 male students. The participants in summer schools were especially from Computer Engineering department (21 students) but there were also students from other departments in summer school. The cumulative GPA of the students in summer school was in the range of 1.81 and 3.2 and the mean is 2.28.

Of 49 students, 17 were in fourth grade, 14 were in third grade, 13 were in second grade and 5 were in the first grade. In addition to that, of 49 students, 20 were from the department of Computer Education and Instructional Technology, 1 was from the department of Business Administration, 21 were from Computer Engineering, 2 were from Chemistry Education, 1 was from the department of chemistry, 1 was from the department of Food Engineering, 1 was from the department of Geological Engineering, 2 were from the department of physic education.

The total number of students who enrolled CEIT 321 course in fall semester of 2008/2009 academic year was 29. There were 6 female 23 male students in the class. All the students were from CEIT department. The cumulative GPA of the students in the fall semester was in the range of 2.00 and 3.81 and the mean was 2.70. Of 28 students 1 was in fourth grade, 2 were in third grade, 25 were in second grade and 1 was in first grade.

3.4 Description of the Course

The CEIT 321 course titled “Foundations of Distance Education” is given two times in a year. The students can take this course in summer school or fall semester of the academic year. This course is offered as a must course for the third year CEIT students. However, since there is not prerequisite for this course, CEIT students can take the course in their first second or fourth year if their schedule is suitable. Moreover, in summer schools the students from other departments can take this course as an elective course with the permission of the course instructor.

The course covers general principals related with distance education. In this course, it is aimed to provide an integrated framework to explore theory of distance education within practice. The topics of the course are distance technologies, implications for teaching and learning, issues and trends of distance education and researches in the distance education area.

An overall goal of this course is to inform the students about the distance education. The objectives of the course are;

- Students will be able to describe examples of various distance learning delivery systems and explore their implications for teaching and learning.
- Students will be able to use professional journals and established distance learning references as resources to identify historical and contemporary trends in the field and to suggest areas of emerging interest for teachers, students and administrators.
- Students will be able to compare and contrast the nature of interactivity in traditional and virtual classrooms, including both synchronous and asynchronous environments.
- Students will be able to review representative literature in distance and distributed learning and propose a research agenda to challenge conclusions reported or to replicate, extend or modify an existing line of inquiry.

- Students will be able to work successfully in a group of your peers to complete an in depth academic project of quality with a separation of time and place.

Blended learning method which blended face-to-face learning with online learning was used in the course. The students were offered with a face-to-face traditional lecturing of two hour lessons in the classroom. The instructor used lecturing methods to teach the concepts of the distance education in this face-to-face traditional learning environment. In this classroom hours, the instructor discussed the main points of the week topic with the students.

In the online part of the course, the students used Moodle as the course web site. Students could access the Moodle in 24 hours at seven days. Each week, the instructor uploaded the new course topic and content to the course web site prepared by using Moodle application. By this, students read the necessary materials before face-to-face lecture and were prepared for the face-to-face lessons. In addition to that, instructor uploaded discussion questions to encourage the students to share their knowledge with each other and instructor. Discussion activities were conducted via the forums and wiki in asynchronous mode. Students discuss about the concepts and topics of distance education every week based on the questions posed by the instructor at the beginning of the week. By such kind of activities, students generated and expanded their knowledge. Moreover, to understand the students' knowledge, the instructor uploaded the assignments in the Moodle. Students had to do assignments and uploaded it to Moodle before the due date of the assignments. After the due date Moodle did not allow the students to upload their assignments. Furthermore, they took the quizzes that include questions related with the topic of the week in every week. The quiz was opened in two days period and the students could take the quizzes whenever they want. The results of the quiz and the scores of the students were sent to the students immediately so that they could see their

performance in the quizzes without delay.

3.4.1 The Course Web Site Prepared by Using Moodle

3.4.1.1 Introduction Page

The course web site had an introduction page in which the students saw the courses they attended and description of the course. The Figure 3.1 shows the introduction page of Moodle.

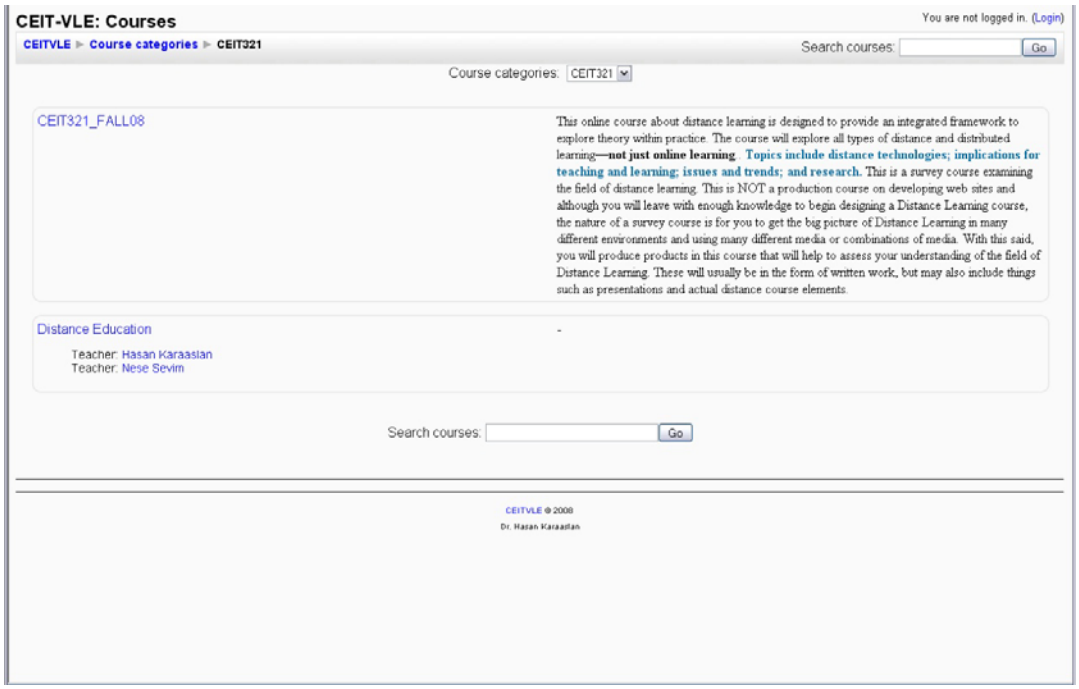

Figure 3.1 Introduction Page of Moodle in CEIT 321 Course

3.4.1.2 Login Page

After the course selection, the students faced a login page. In this page, they had to enter their user-id and password information. Figure 3.2 shows the login page of Moodle.

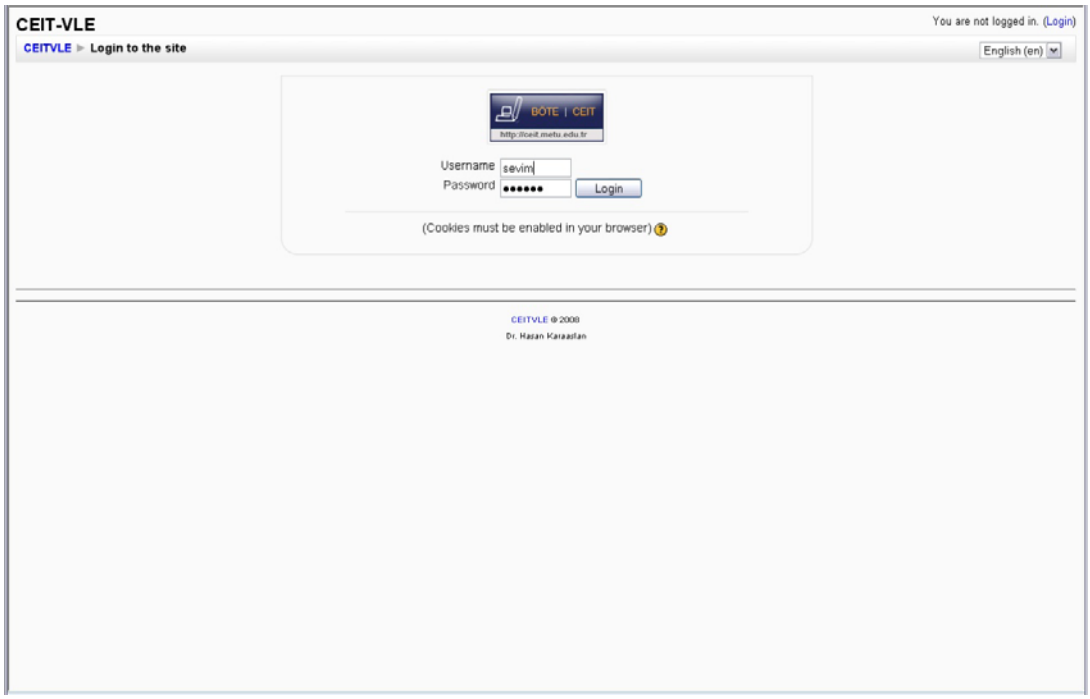

Figure 3.2: Login page of Moodle in CEIT 321 Course

3.4.1.3 Home Page

After the entrance of user-id and password information correctly, the home page of the course web site was appeared. In this page, Moodle offered the following components, Syllabus, Forum, Lecture Notes, Assignments, Quiz, Wiki, Glossaries, Calendar, Activities, Latest News, Upcoming Events, Recent Activity and Grades.

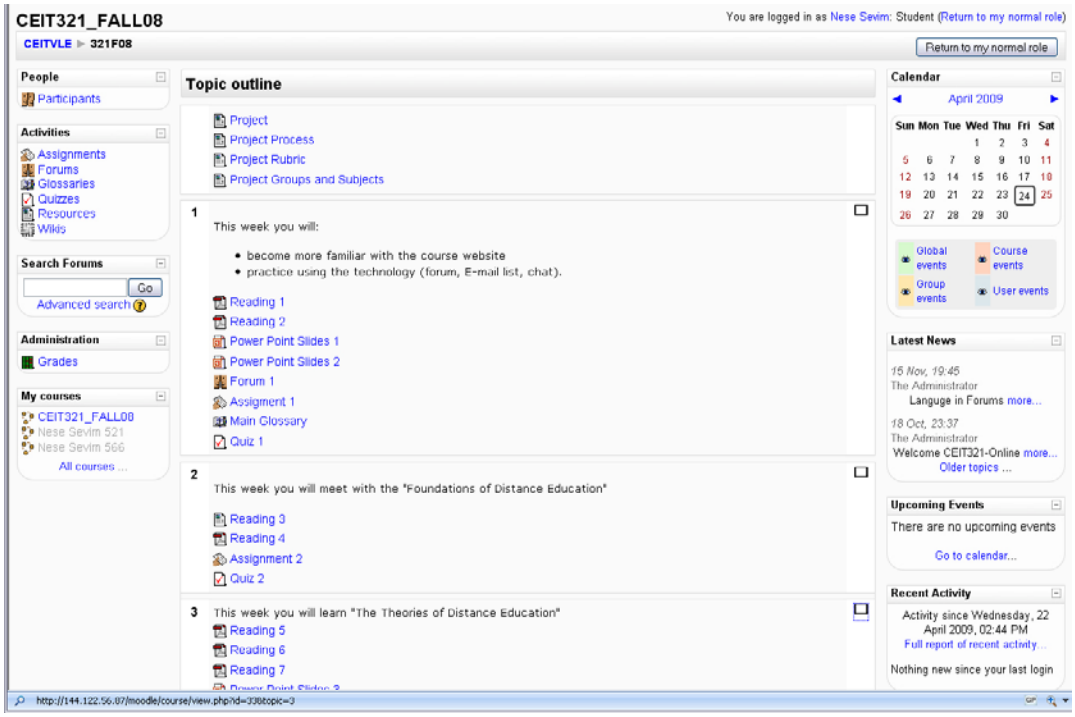

Figure 3.3: Home Page of Moodle in CEIT 321 Course

3.4.1.4 Assignment Page

In the assignment page, the students saw their assignments and due date of the assignment. They could upload their assignments to the same page before its due date. Figure 3.4 shows the assignment page of Moodle.

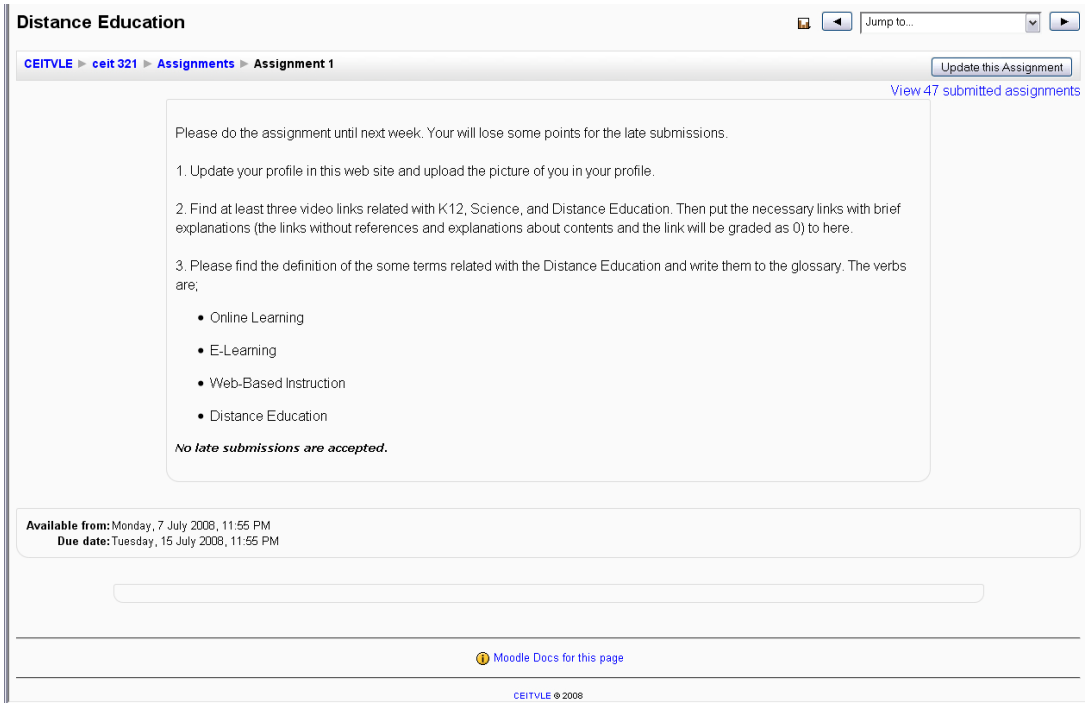

Figure 3.4: Assignment Page of the Moodle in CEIT 321 Course

3.4.1.5 Forum Page

In forum page, students could post anything in order to share their ideas. In CEIT 321 course, the instructor guided the students by asking questions but the students were free to write anything they wanted. Figure 3.5 shows the forum page of Moodle.

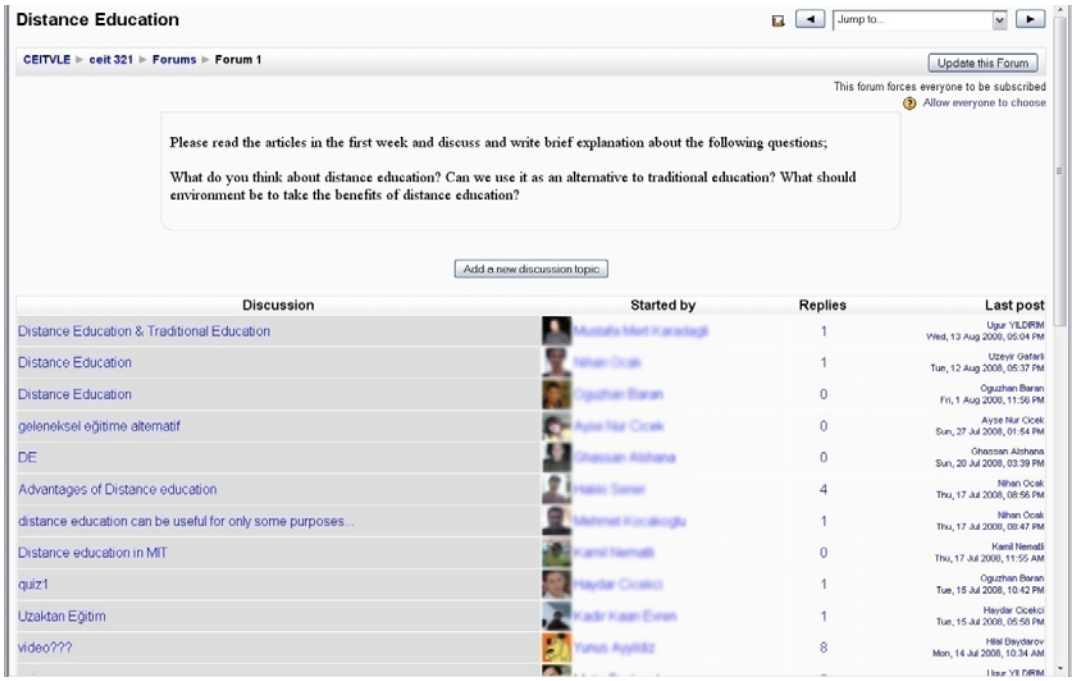

Figure 3.5: Forum Page of the Moodle in CEIT 321 course

3.4.1.6 Glossary

In CEIT 321 course, students wrote the definitions of important terms in their own sentences and share them with their friends in glossary page in order to build their knowledge. Figure 3.6 shows the glossary page of Moodle.

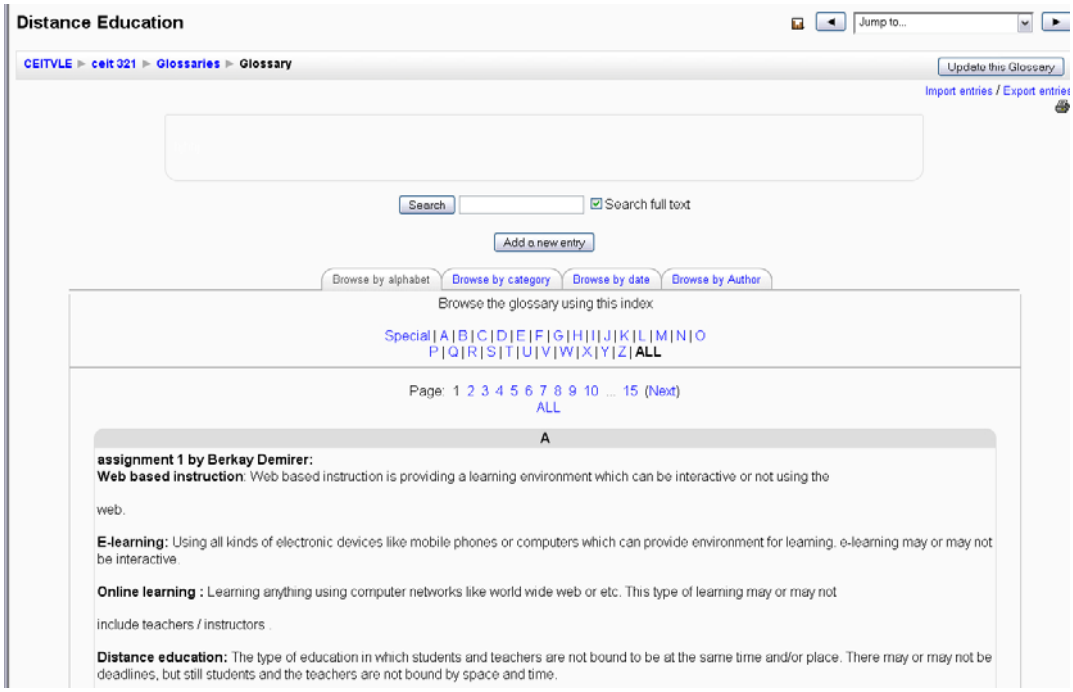

Figure 3.6 Glossary Page of the Moodle in CEIT 321 course

3.4.1.7 Quiz Page

In CEIT 321 course the quiz application opened and closed at specific times. Students could take the quiz at these specific times. After they finished, immediate feedback about their attempts and the answer of the questions in the quizzes was given. Figure 3.7 shows the quiz page of Moodle.

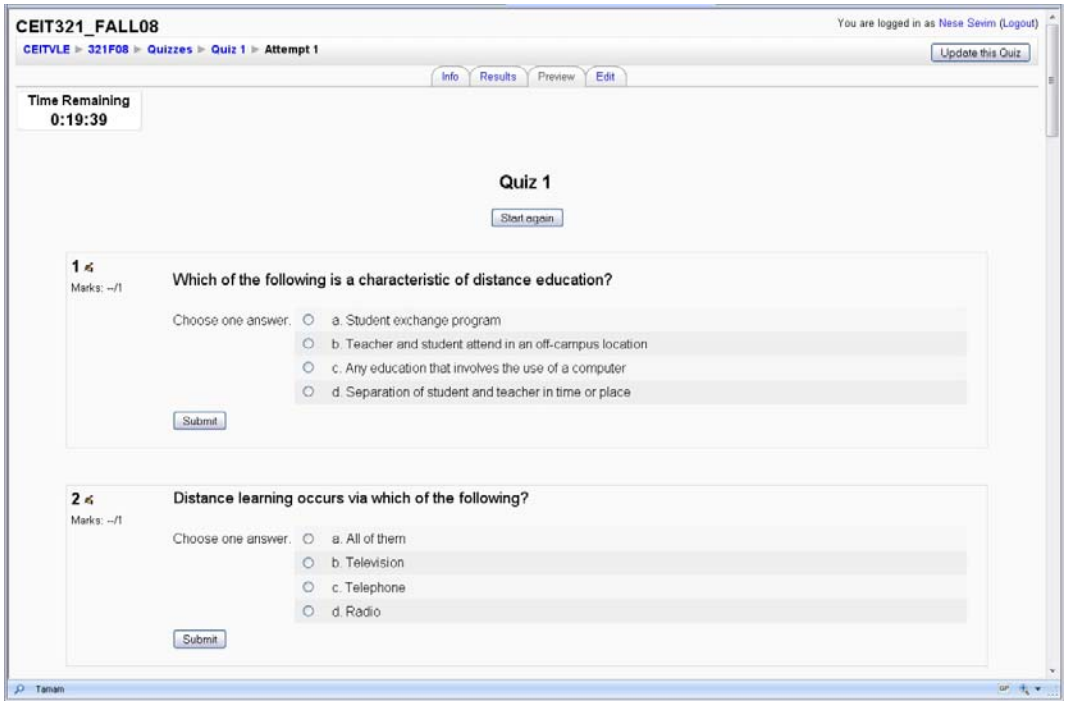

Figure 3.7: Quiz Page of the Moodle in CEIT 321 course

3.4.2 Evaluation and Grading Strategies

In this course different assessment strategies were used to assess the students' performance. Four measurement criteria were used to evaluate students' achievement in the course in terms of online activities (quizzes, forums, assignments etc), project, attendance to face-to-face lectures and final exam. Final exam were distributed on paper. The distribution of evaluation and grading scores in the course can be seen in Table 3.1.

Table 3.1: Distribution of Evaluation and Grading Scores in the Course

Measurement	Points
Online activities	300
Project	200
Attendance	100
Final	200
Total	800

3.5 Data Collection Instruments

In this study, both qualitative and quantitative data is collected from the participants. The students were given 5-point Likert type questionnaire which contains 66 items both at the end of the summer school and fall semester (Appendix A). The questionnaire was in English and the items in the questionnaire were prepared according to the previous research studies in this field. The items in the questionnaire were adapted from the measurement defined by Ham (2002, cited in Çetiz, 2006) and Pierrotti (1995, cited in Kavaklı, 2004). The questionnaire was checked by two experts in the CEIT department before delivering to the students.

A semi-structural interview was carried out with 10 volunteer students to get deep understanding of students' perception about the Moodle application. The questions were prepared according to the previous research done by Çetiz (2006) and they were checked by two experts in CEIT department. (Appendix B). The questions in the interview were in Turkish. By this, the researchers aimed to make the students feel comfortable while they were expressing themselves during the interview process.

3.5.1 Evaluation of Students' Perceptions about Moodle Questionnaire

The questionnaire used in this study was developed from two studies Çetiz (2006) and Kavaklı (2004).

Çetiz (2006) researched about the students' and instructor's perception of a blended course. The items in her questionnaire were originally developed by Dr. Roxanne Hiltz in order to identify the effectiveness of the Virtual Classroom in the late 1980's. Then, Ham (2002) updated the items to asses web and new teaching related activities used in many web-based supported courses. Kavaklı (2004) researched about a course-content management system development and its usability. The checklist he used was adapted from the study done by Pierotti (1995).

The questionnaire was divided into four parts to give the students clue about what the items were related to.

The first component of the questionnaire included items that aimed to gather information about the students' demographic data. In this part, students' gender, their high school type, department of the students, the year students in their program of study, cumulative GPA (general points of average), whether they take CEIT 321 or course that includes the topic of CEIT 321 before, students' previously course management system experience , previously online course experience, students' computer knowledge level, time that students spent each week on CEIT 321 course, computer ownership, the place that students' primarily used to access to the course were identified.

The second part of the questionnaire was used to gather information about the students' perceptions towards CEIT 321 course and online course. There were seven items that aimed to help to find to what students thought related with Foundations of Distance Education course.

The third part of the questionnaire was used to gather information about students' general ideas related with Moodle. There were thirty four items that aimed to help to find what students thought about Moodle application.

In the fourth and last part of the questionnaire, there were items about the applications of Moodle. In this part, there were twenty five items which aimed to gather information about the students' perception about Moodle features in terms of forums, wiki, chat tool, quiz and calendar and dictionary.

The subscale items of second, third and fourth part of the questionnaire were rated on Likert type scale. The 5-point Likert type was used in these parts. For the responses of students, 1 represented strongly disagree, 2 showed disagree, 3 was for neutral, 4 represented agree and 5 equaled to strongly agree.

3.5.2. Interview with the Students about the Course

Besides the questionnaire, the researchers made an interview with 2 volunteer students who had participated the study in the 2008 summer school and 8 volunteer students who had participated in 2008/2009 fall semester. The aim of the interview was to get deep understanding about their perceptions towards Moodle application with their own words. According to Patton (1990, cited in Best & Khan, 1993), the purpose of making interview is to find out what is in or on someone else's mind. The interview questions were prepared in order to investigate students' opinions, suggestions, comments and experiences about the Moodle.

The researchers prepared an interview guide which contains seven questions to make sure that all the relevant topics were covered (Appendix B). To illuminate the interview topics deeply, the researcher conducted semi-structured interview. The interview questions was checked by two experts in CEIT department and found valid. Interviews were conducted at the beginning of the fall semester with 2 students

who participated in the study in summer school and at the beginning of the spring semester with 8 students who attended the study in fall semester.

3.6. Data Collection Procedures

In 2008 summer school 49 students and in the fall semester of 2008/2009 academic year 29 students enrolled in CEIT 321 course. Since there were two groups who took the course in different times the questionnaire was distributed and the interview was conducted twice in a year. The first group who took CEIT 321 course in the summer school took the questionnaire at the end of the summer school. All the students in the course did the questionnaire so that 49 questionnaires were returned from students. The second group who took CEIT 321 course in the fall semester of academic year 2008/2009 took the questionnaire at the end of the fall semester. All the students in this group also filled the questionnaire so that 29 questionnaire were returned from students.

At the beginning of the fall semester of academic year 2008/2009, two voluntary students who were in the first group made interview with the researcher. And at the beginning of spring semester of academic year 2008/2009 the interviews with the eight voluntary students who had participated the study in summer were conducted.

Before the interview, the researcher had made an interview guide to make sure that all the topics in the interview would be covered. This guide helped the researcher to understand the perception of students about Moodle application. During the interview process, the interview guide was used. According to the response of the students, the researcher asked new questions to make sure that the students expressed themselves deeply. The interview was held in Turkish to make the students feel comfortable during the interview. It was assumed that the students expressed themselves more smoothly in their native language. The researcher conducted interview sessions with one student at a time in an office located at Faculty of

Education at METU. The interview process took 8 to 10 minutes for each student. At the beginning of the interview process, the students were informed about the goal of the study. Moreover, the questions of the interview was showed the students and asked whether they want to answer the questions. Then, the researcher wanted the students to sign "Participant Informed Consent Form" (Appendix C) which showed that students participating the research study voluntarily. The interview process was recorded and kept confidentially with the tape recorder.

3.7 Data Analysis

In this study both the qualitative and quantitative data were obtained from the students. To analyze the data obtained from questionnaire, descriptive statistic with SPSS for Windows was used. The major advantage of descriptive statistics is that it allows the researcher to reach the information from many scores by analyzing few indices like the mean and median (Fraenkel & Wallen, 2006).

In the quantitative data analysis, the mean of the overall and subscales of the questionnaire was calculated. During the data analysis, the questions were grouped according to their relevance to each other. Moreover, some items in the questions were rewritten to understand whether the students filled the questionnaire carefully. The mean score of the questions were categorized in terms of negative, neutral and positive. If the mean score of the item was below 2.59, students' perceptions were accepted as negative. If the mean score was between 2.60 and 3.39, perception was accepted as neutral. If it was more than 3.40 out of 5 it were accepted as positive. The items were grouped seven categories in terms of course, objectives and content of the course CEIT 321 online course communication through Moodle, help, and prevention, diagnose, recover from errors, user interface, easement of access, user control and freedom in the Moodle, help and documentation, Moodle and its applications.

In the qualitative data analysis, the students' responses in the interview which had been recorded during the interview process were written by using the word processing program. They were transcribed word by word so that all the responses were read over and over again to understand the participants' general opinions. Then, the researcher identified the themes and organized these themes. In the interview process, the same questions were asked to the students in order to find out similar themes based on the students' responses. Finally, the themes were analyzed deeply to draw conclusion from the interviews with the students.

3.8. Assumptions of the Study

The following assumptions were accepted in this study:

- The participants would fill the questionnaires accurately.
- The participants would respond the interview questions honestly.
- The data were collected and recorded appropriately.
- The participants' comprehension of English was sufficient to understand and respond the questions in questionnaire accurately since the questionnaire was prepared in English.

3.9. Limitations of the Study

The following limitations were recognized throughout the study:

- This research is limited to reliability of the instruments used in the research.
- The results obtained from the data collection instruments are limited to honesty of the subjects and the biases of the interviewer researcher.
- The data was collected two times in a year, in fall semester and summer school. For this reason, the conditions students faced were different in this study. The responses of the students are limited to conditions students had

in these semesters.

- Since it was a case study, the findings and conclusions gathered from the study was limited to this research case. For this reason, the results gathered from different courses designed by different instructor would be different.
- The validity of the study was limited to the honesty of participants' responses given to data collection instruments used in the study.
- Due to the reason that the questionnaire was prepared in English, the validity of the students' responses in questionnaire was limited with the students' English level.

CHAPTER 4

RESULTS

In this chapter, participants' demographic data, statistical results of the questionnaire, and the results of interview made with the students are presented. To analyze the data, SPSS 15.0 (Statistical Package for Social Science) software program was used.

4.1 Demographic Data

The first part of the questionnaire contained 12 items related with general information about students participated in the study. It was used to gather demographic data from the participants of the study and it was covered the following issues; gender, high school type , department of the students, the year students in their program of study, cumulative GPA (grade point average), whether they take CEIT 321 or course that includes the topic of CEIT 321 before, students' previously course management system experience, previously online course experience, students' computer knowledge level, time that students spent each week on CEIT 321 course, computer ownership, the place that students' primarily used to access to the course.

In the 2008 summer school, 49 students attended to this study and all of them completed the questionnaire at the end of the summer school. The data were composed 28.6% female students (number of female students were 14) and 71.4% male students (the number of male students were 35). 80% of the students had more than 2.00 cumulative GPA. The range of the GPA of the students in summer school was between 1.81 and 3.2. And the mean is 2.28. Of 49 students 17 were in fourth grade, 14 were in third grade, 13 were in second grade and 5 were in the first grade. Moreover, 20 students were from the department of Computer and Instructional Technology, 1 were from the department of Business Administration, 21 were from

Computer Engineering, 2 were from Chemical Education, 1 was from the department of chemistry, 1 was from the department of Food Engineering, 1 was from the department of Geological Engineering, 2 were from the department of physic education. In addition to that, the high school types of the students were also asked in the questionnaire. 6 students were graduated from General High School, 14 were from Anatolian High School, 3 were from Private High School, 9 from Vocational High School, 8 were from Technical School, and 9 were from other types. Table 4.1 summarizes the demographic data of students in the summer school in terms of gender, cumulative GPA, grade, department, the type of their high school.

Table 4.1: Gender, cumulative GPA, Departments, High School Type of students in 2008 summer school

VARIABLE	FREQUENCIES	PERCENTAGES
Gender		
Female	14	28.6%
Male	35	71.4%
Cumulative GPA		
Less than 2.00	12	24.49%
2.01-3.00	30	6.12%
3.01-4.00	4	8.16%
Departments		
Computer Engineering	21	42.8%
Comp. and Inst. Tech.	20	40.9%
Chemistry Education or Chemistry	3	61.2%
Food or Geological Engineering	2	4.0%
Physic Education	2	4.1%
Business Administration	1	2.0%
High School Type		
General	6	12.2%
Anatolian	14	28.6%
Private	3	6.1%
Vocational	9	18.4%
Technical	8	16.3%
Others	9	18.4%

In addition to this information, the data about whether they take CEIT 321 or course that includes the topic of CEIT 321 before, students' previously course management

system experience, previously online course experience, students' computer knowledge level, time that students spent each week on CEIT 321 course, computer ownership, the place that students' primarily used to access to the course also collected from the students in summer school. Almost all of the students in summer school had computers (91.8%). Only small portion, 8.2% did not have computers. The computers that most of the students used to access the course site were located at their home (59.2%). Most of the students (55.1) defined their computer knowledge level was intermediate level. 38.8% defined themselves as expert whereas 6.1% were elementary. 81.6% of the students had used course management systems like METU online before. In other words, 81.6% of the students were familiar with the course management systems. Only 18.4% had not used any course management systems before in their educational life. Of 49 students only 4 (8.2%) took one online and 12 (24.5%) students took 2 online course before. Two (4.1%) students took 3 and 1 (2.0%) students took 4 online course before the study. 87.8% of the students did not take CEIT 321 or any course related with the topic distance education. The times students spent on Moodle were varied. 28.6% spent between 6 and 9 hours on this course. 26.5% spent 3 or 5 hours. 24.5% one or two hours. 20.4% spent more than 10 hours in a week. Table 4.2 summarized the data about CEIT 321 Experiences, CMS experiences, Computer Knowledge Level, Time Spent on the Course Each Week, Computer Ownership, the Place Where Students' Access the Course.

Table 4.2: CEIT 321 Experiences, CMS experiences, Computer Knowledge Level, Time Spent on the Course Each Week, Computer Ownership, the Place Where Students' Access the Course of students in 2008 summer school

VARIABLE	FREQUENCIES	PERCENTAGES
Having CEIT 321 Experiences		
Yes	2	4.1%
No	47	95.9%
Having previous CMS experience		
Yes	40	81.6%
No	9	18.4%
Computer Knowledge Level		
Elementary	3	6.1%
Intermediate	27	55.1%
Expert	19	38.8%
Time Spent on the course each week		
1-2 hour	12	24.5%
3-5 hour	13	26.5%
More than 5	24	49%
Computer Ownership		
Yes	45	91.8%
No	4	8.2%
The Place Where Students' Access the Course		
Computer Lab	6	10.2%
Dormitory or Home	43	88.8%

In the fall semester of 2008-2009, 29 students attended to this study. All of the 29 participants filled the questionnaire distributed at the end of the fall semester. The data were composed 20.7% female students (number of female students were 6) and 79.3% male students (the number of male students were 23). All the students in the fall semester had more than 2.00 cumulative GPA. Of 28 students 1 was in fourth grade, 2 were in third grade, 25 were in second grade and 1 was in first grade. All the students in fall semester were in the CEIT department. The cumulative GPA of the students in the fall semester was in the range of 2.00 and 3.81 and the mean was 2.70. Moreover, 4 students were graduated from General High School, 4 were from Anatolian High School, 1 was from Private High School, 9 were from Vocational High School, and 11 were from Technical School. Table 4.3 summarized the demographic data in terms of gender, cumulative GPA, grade, department, the type of their high school.

Table 4.3: Gender, cumulative GPA, Departments, and High School Type of the students in fall semester of 2008/2009 academic year.

VARIABLE	FREQUENCIES	PERCENTAGES
Gender		
Female	6	20.7%
Male	23	79.3%
Cumulative GPA		
Less than 2.00	1	3.4%
2.01-3.00	22	76.2%
3.01-4.00	6	20.4%
Departments		
Comp. and Inst. Tech.	29	100%
High School Type		
General	4	13.8%
Anatolian	4	13.8%
Private	1	3.4%
Vocational	9	31.0%
Technical	9	31.0%
Others	2	6.9%

The data about whether they take CEIT 321 or course that includes the topic of CEIT 321 before, students' previously course management system experience, previously online course experience, students' computer knowledge level, time that students spent each week on CEIT 321 course, computer ownership, the place that students' primarily used to access to the course also collected from the students who attend to this study in fall semester of 2008/2009 academic year. All the students in the survey had not take CEIT 321 or any course related with CEIT 321 before the study. And

most of them (55.2%) used some course managements system in their lives. However, most of them had not attended any online course before (69.0%). 27.6% of them had taken one or two online course. 69.0% of the students defined their computer knowledge level as intermediate. 19 students out of 49 thought that they were expert. 41.4% of the students spent one or two hours per a week on this course and 31.0% spent 3 or 5 hours. Only 6.9% of the students spent more than 13 hour. Most of the students in the survey accessed the course web site from their dormitory room (44.8.0%). 37.9% of the students used computers at their home. Almost all the students had their own computers (96.6%). Table 4.4 summarizes the data about CEIT 321 Experiences, CMS experiences, Computer Knowledge Level, Time Spent on the Course Each Week, Computer Ownership, the Place Where Students' Access the Course.

Table 4.4: Students' CEIT 321 Experiences, CMS experiences, Computer Knowledge Level, Time Spent on the Course Each Week, Computer Ownership, and the Place Where Students' Access the Course in fall semester of 2008/2009 academic year.

VARIABLE	FREQUENCIES	PERCENTAGES
Having CEIT 321 Experiences		
No	29	%100
Having previous CMS experience		
Yes	16	55.2%
No	13	44.8%
Computer Knowledge Level		
Elementary	3	10.3%
Intermediate	20	69.0%
Expert	6	20.7%
Time Spent on the course each week		
1-2 hour	5	17.2%
3-5 hour	12	41.4%
More than 5	12	41.4%
Computer Ownership		
Yes	27	93.1%
No	2	6.8%
The Place Where Students' Access the Course		
Computer Lab	3	10.3%
Dormitory or Home	26	89.7%

4.2 Questionnaire Results:

The students' attitudes towards Moodle and its application were analyzed under seven categories. These categories obtained from the items in the questionnaire delivered to the students.

4.2.1 Course, Objectives and Content of the Course CEIT 321

Firstly, the students' perceptions in summer school of 2008 and fall semester of 2008/2009 towards the course, objectives and content were analyzed. The percentages of the responses of the students in summer school are given in Table 4.5 and the responses of the students in fall semester are given Table 4.6. The related items were 1, 2 and 35. Moreover, the percentages of grades students got were also analyzed in order to understand their perceptions about the course. Overall, the students' perception towards the course was positive. The grades are given in the Table 4.7 and Table 4.8. The mean value of the items 1, 2 and 35 was 3.80 for summer school and 3.59 for fall semester.

Table 4.5: Distribution of Responses for Item 1, 2, and 35 in 2008 summer school.

Item	Percentages and Number of Responses					
	SD	D	N	A	SA	Mean
1		2 (4.1%)	10 (20.4%)	24 (49%)	13 (26.5%)	3.98
2	2 (4.1%)	1 (2.0%)	13 (26.5%)	23 (46.9%)	10 (20.4%)	3.78
35	2 (4.1%)	4 (8.2%)	9 (18.4%)	26 (53.1%)	6 (12.2%)	3.63
Sub Scale Mean Score						3.80

Table 4.6: Distribution of Responses for Item 1, 2, 35 in fall semester of 2008/2009 academic year.

Item	Percentages and Number of Responses				
SD	D	N	A	SA	Mean
1	4 (13.8%)	6 (20.7%)	14 (48.3%)	5 (17.2%)	3.69
2	3 (10.3%)	9(31.0%)	12 (41.4%)	5 (17.2%)	3.66
35	4 (13.8%)	9 (31.0%)	14 (48.3%)	1 (3.4%)	3.43
Sub Scale Mean Score					3.59

Table 4.7: Distribution of Grades of Students in 2008 summer school

Grades	Percentages and Number of Grades
AA	18 (36.73%)
BA	22 (44.9%)
BB	5 (10.20%)
CB	3 (6.12%)
CC	1 (2.04%)

Table 4.8: Distribution of Grades of Students in fall semester of 2008/2009 academic year

Grades	Percentages and Number of Grades
AA	12 (41.38%)
BA	13 (44.83%)
BB	2 (6.90%)
CB	1 (3.45%)
CC	1 (3.45%)

The first item had the highest mean value in this category. In the first item the students were asked whether the course objectives were clear and achievable. 75.5% of the students in summer school and 65.5% of the students in fall semester agreed or strongly agree with the statement given in the item. The mean value of the responses given in summer school was 3.98 and in fall semester it was 3.69. It shows that nearly all of the students agreed that the objectives of the course were clear and achievable.

In the second item it was asked whether the course was interesting. The mean value of this item was 3.78 in summer school and 3.66 in fall semester. In other words, most of the students agreed that the course was interesting.

In item 35, the students were asked whether the students gained skills that were useful in their actual or chosen profession. 65.3% of the students in summer school and 51.7% in fall semester were agreed or strongly agreed that they gained skills that were useful in their actual or chosen profession.

4.2.2 Online Course

In the questionnaire, the perception of participants towards online course was gathered from the related items 3, 4, 5, 6, 7, 33, 34, 40 and 41. The percentages and mean value of the items were given in Table 4.9 and Table 4.10. Overall, the students' perception towards online course through Moodle was positive. The mean value of the items was 3.25 for summer school and 3.22 for fall semester.

The highest mean score among these items under this category belonged to item 3. With the item 3, the students were asked whether the course was appropriate for online learning. The mean score of this item was 4.08 for summer school and 4.10 for fall semester. 81.6% of the students in the summer school and 86.2% of the students in fall semester agreed with the statement. It showed that most of the participants in this study thought that the course was appropriate for online learning.

Table 4.9: Distribution of Responses for Item 3, 4, 5, 6, 7, 33, 34, 40, and 41 in 2008 summer school.

Item	Percentages and Number of Responses					
	SD	D	N	A	SA	Mean
3	1 (2.0%)	2 (4.1%)	6 (12.2%)	23 (46.9%)	17 (34.7%)	4.08
4	3 (6.1%)	7 (14.3%)	9 (18.4%)	19 (38.8%)	11 (22.4%)	3.57
5	18 (36.7%)	15 (30.6%)	11 (22.4%)	4 (8.2%)	1 (2.0%)	2.08
6	6 (12.2%)	14 (28.6%)	15 (30.6%)	9 (18.4%)	5 (10.2%)	2.85
7	3 (6.1%)	5 (10.2%)	10 (20.4%)	21 (42.9%)	10 (20.4%)	3.61
33	2 (4.1%)	5 (10.2%)	9 (18.4%)	23 (46.9%)	9 (18.4%)	3.66
34	5 (10.2%)	7 (14.3%)	10 (20.4%)	19 (38.8%)	7 (14.3%)	3.33
40	3 (6.1%)	6 (6.1%)	9 (18.4%)	25 (51.0%)	8 (16.3%)	3.67
41*	14 (28.6%)	13 (26.5%)	12 (24.5%)	6 (12.2%)	3 (6.1%)	2.40
*: Reversed Item						
Sub Scale Mean Score						3.25

In the item 4, it was asked whether taking online course was more convenient. The mean score of this item was 3.57 for summer school and 3.75 for fall semester. The responses showed that more than half of the students agreed that taking online course was more convenient.

Item 5 had the lowest mean score than the items in this category. In item 5, the students were asked whether taking online lessons was boring. The mean score of this item was 2.08 for summer school and 2.25 for fall semester. Only 10.2% of the students in summer school and 13.8% of the students in fall semester thought that taking online course was boring.

Table 4.10: Distribution of Responses for Item 3, 4, 5, 6, 7, 33, 34, 40, and 41 in fall semester of 2008/2009 academic year.

Item	Percentages and Number of Responses					
	SD	D	N	A	SA	Mean
3			4 (13.8%)	18 (62.1%)	7 (24.1%)	4.10
4		1 (3.4%)	9 (31.0%)	14 (48.3%)	4 (13.8%)	3.75
5	6 (20.7%)	13 (44.8%)	5 (17.2%)	4 (13.8%)		2.25
6	2 (6.9%)	6 (20.7%)	11 (37.9%)	9 (31.0%)	1 (3.4%)	3.03
7		2 (6.9%)	8 (27.6%)	15 (51.7%)	3 (10.3%)	3.68
33	1 (3.4%)	6 (20.7%)	7 (24.1%)	7 (24.1%)	7 (24.1%)	3.46
34	2 (6.9%)	6 (20.7%)	12 (41.4%)	8 (27.6%)		2.92
40		3 (10.3%)	11 (37.9%)	11 (37.9%)	3 (10.3%)	3.50
41*	5 (17.2%)	8 (27.6%)	5 (17.2%)	9 (31.0%)	1 (3.4%)	2.75
*: Reversed Item						
Sub Scale Mean Score						3.22

In the item 6, the students were asked whether online lessons were better learning experiences than traditional learning. The mean score of this item was 2.86 for summer school and 3.03 for fall semester. Totally, only 30.8% of the students agreed that online course was a better learning experience than traditional learning whereas %33.3 of the students were neutral to the statement.

In the item 7, it was asked whether accessing online lecture notes made positive contribution to students' learning. The mean score of this item was 3.61 for summer school and 3.68 for fall semester. Most of the students agreed or strongly agreed that accessing online lecture notes made positive contribution to their learning.

In item 33, it was asked whether the students would recommend taking online course given through Moodle to friends or associates. 65.3% the students in summer school and 48.2% of the students in fall semester were agreed or strongly agreed with the statement.

In the item 34 it was asked whether online courses through the use of Moodle were more advantageous than traditional learning. Nearly half of the students (43.6%) in summer school and fall semester were agreed or strongly agreed with the statement whereas 25.7% disagreed or strongly disagreed.

In item 40, it was asked whether the Moodle was a good way to learn the topics of the course. Most of the students in summer school and fall semester were agreed or strongly agreed with the statement. The mean score of the item was 3.67 for summer school and 3.50 for fall semester.

The lowest mean score in this category belong to item 41. The item 41 was reversed form of item 33. In item 41, it was asked whether the students would not take another online course which was given through Moodle. Approximately half of the students were disagreed or strongly disagreed with the statement. The mean score of this item was 2.40 for summer school and 2.75 for fall semester.

4.2.3 Communication through Moodle

In the questionnaire, there were 3 items to understand their perception about the communication through Moodle. The percentages of the students' responses to the related items are given in Table 4.11 and Table 4.12. The related items were 20, 38 and 42. Overall, the students thought that there were enough communication opportunities in Moodle. The mean value of the items in this category was 3.72 for summer school and 3.57 for fall semester.

Table 4.11: Distribution of Responses for Item 20, 38 and 42 in 2008 summer school.

Item	Percentages and Number of Responses					
	SD	D	N	A	SA	Mean
20		2 (4.1%)	6 (12.2%)	27 (55.1%)	14 (28.6%)	4.08
38	3 (6.1%)	3 (6.1%)	14 (28.4%)	16 (32.7%)	11 (22.4%)	3.62
42	3 (6.1%)	7 (14.3%)	10 (20.4%)	21 (42.9%)	7 (14.3%)	3.46
Sub Scale Mean Score						3.72

Table 4.12: Distribution of Responses for Item 20, 38 and 42 in fall semester of 2008/2009 academic year.

Item	Percentages and Number of Responses					
	SD	D	N	A	SA	Mean
20		2 (6.9%)	6 (20.7%)	14 (48.3%)	6 (20.7%)	3.85
38		3 (10.3%)	10 (34.5%)	10 (34.5%)	5 (17.2%)	3.61
42		4 (13.8%)	14 (48.3%)	11 (37.9%)		3.24
Sub Scale Mean Score						3.57

The item 20 has the highest mean value in this category (4.08 for summer school and 3.85 for fall semester). In item 20, it was asked whether the Moodle provided access to instructor or other students. Majority of the students were agreed or strongly agreed with the statement. In other words, 83.7% of the students in summer school and 69% of the students in fall semester agreed that Moodle provided opportunities to access their instructor or their fellows.

In item 38, the students were asked whether it was easy to conduct online discussions in the Moodle. The mean values of this item in summer school and fall semester was nearly the same (3.62 for summer school and 3.61 for fall semester). Nearly half of

the students thought that it was easy to conduct online discussion in the Moodle.

In item 42, it was asked whether there were sufficient opportunities to interact with classmates online in Moodle. Half of the students in summer school and fall semester were agreed or strongly agreed with the statement. The mean score of this item was 3.46 for summer school and 3.24 for fall semester.

4.2.4 Help and Prevention, Diagnose, Recover from Errors

In the questionnaire, the perception of participants towards help prevention diagnoses and recover from errors in Moodle was gathered from the related items 16, 18, 19, 22, 23, 24. The percentages and mean value of the items were given in Table 4.13 and Table 4.14. The mean value of the items in this category was 3.19 for summer school and 3.29 for fall semester.

Item 16 had the highest mean score than the other items in this category. In item 16, it was asked whether prompts were stated constructively, without overt or implied criticism of the user in the Moodle. 57.1% of the students in summer school and 75.8% of the students in fall semester were agreed or strongly agreed with the statement. The mean score of this item was 3.50 for summer school and 3.86 for fall semester.

In item 18, the students were asked whether the Moodle prevented users from making errors whenever possible. The mean score of this item was 3.23 for summer school and 3.27 for fall semester. In both of the groups, only 37.2% of the students were agreed or strongly agreed with the statement whereas 41% was neutral.

The statement of item 19 was revised version of item 18. It was asked whether the Moodle warned users if they were about to make a potentially serious error. The responses of the students were consistent. In both of the groups, only 40.8% of the students were agreed or strongly agreed with the statement. The mean score of this item was 3.38 for summer school and 2.96 for fall semester.

In item 22, it was asked whether error messages informed the user of the error's severity. The mean score of this item was 3.41 for summer school and 3.33 for fall semester. Almost half of the students in summer school and fall semester (48.7%) were agreed or strongly agreed with the statement.

Item 23 had the lowest mean score than the items in this category. In item 23, the students were asked whether the error massages stated the cause of the problem. Only 40.8% of the students in summer school and 34.4 % of the students in fall semester were agreed or strongly agreed with the statement. The mean score of this item was 3.16 for summer school and 3.14 for fall semester.

In item 24, it was asked whether error massages indicated what actions the user needed to take to correct error. In both of the groups, 36.8% of the students were agreed or strongly agreed with the statement whereas 47.4 % of the students neutral. The mean score of this item was 3.23 for summer school and 3.18 for fall semester.

Table 4.13: Distribution of Responses for Item 16, 18, 19, 22, 23 and 24 in 2008 summer school.

Item	Percentages and Number of Responses					
	SD	D	N	A	SA	Mean
16	2 (4.1%)	3 (6.1%)	15 (30.6%)	25 (51.0%)	3 (6.1%)	3.50
18	1 (2.0%)	8 (16.3%)	20 (40.8%)	17 (34.7%)	2 (4.1%)	3.23
19*	2(4.1%)	6 (12.2%)	17 (34.7%)	18 (36.7%)	5 (10.2%)	3.38
22	2 (4.1%)	4 (8.2%)	19 (38.8%)	20 (40.8%)	4 (8.2%)	3.41
23	2 (4.1%)	9 (18.4%)	18 (36.7%)	19 (38.8%)	1 (2.0%)	3.16
24	3 (6.1%)	3 (6.1%)	24 (49.0%)	16 (32.7%)	2 (4.1%)	3.23
*: Revised item						
Sub Scale Mean Score						3.19

Table 4.14: Distribution of Responses for Item 16, 18, 19, 22, 23 and 24 in fall semester of 2008/2009 academic year.

Item	Percentages and Number of Responses					
	SD	D	N	A	SA	Mean
16		1 (3.4%)	6 (20.7%)	18 (62.1%)	4 (13.8%)	3.86
18		7 (24.1%)	12 (41.4%)	5 (17.2%)	5 (17.2%)	3.27
19*		9 (31.0%)	11 (37.9%)	8 (27.6%)		2.96
22		5 (17.2%)	8 (27.6%)	14 (48.3%)		3.33
23	1 (3.4%)	5 (17.2%)	12 (41.4%)	9 (31.0%)	1 (3.4%)	3.14
24		5 (17.2%)	13 (44.8%)	10 (34.5%)		3.18
*: Revised item						
Sub Scale Mean Score						3.29

4.2.5 User Interface, Ease of Access, User Control and Freedom in the Moodle

The students were asked 17 questions to understand their perceptions about the user interface, easement of access, user control and freedom in the Moodle. The questions, percentages and mean value of the items were given in Table 4.15 and Table 4.16. The mean value of the items in this category was 3.69 for summer school and 3.65 for fall semester.

In item 8 the students were asked whether accessing the course materials from Moodle was easy or not. 82.1% of the students in two groups agreed or strongly agreed with the statement. The mean score of the item was 4.06 for summer school and 3.96 for fall semester. The mean scores indicated that students almost agreed that accessing Moodle was easy.

In tem 9, it was asked whether in multi page data entry screen each page was labeled to show its relation to others. 73.5% of the students in summer school and 72.4% of

the students in fall semester agreed or strongly agreed with the statement. The mean value of the item was 3.86 for summer school and 3.76 for fall semester.

In item 10, the students were asked whether every display started with a title or header that described screen content. Most of the students agreed or strongly agreed. The mean score of the item was 3.94 for summer school and 3.86 for fall semester.

Item 11 was about whether the graphic user interface menus made which item had been selected obvious. The mean value of the item was 3.88 for summer school and 3.86 for fall semester. The responses showed that 76.8% of the students in two groups were agreed or strongly agreed with the statement.

In item 12, the students were asked whether on data entry screen tasks were described in terminology familiar to users. 73.5% of the students in summer school and 75.9% of the students in fall semester were agreed or strongly agreed with the statement. The mean value of the item was 3.90 for summer school and 3.83 for fall semester.

Item 13 was about the windows in Moodle. In item 13, it was asked whether it was easy for users to switch between the windows in the Moodle. 76.6% of the students in summer school and in fall semester were agreed or strongly agreed with the statement. The mean value of the item was 3.92 for summer school and 3.75 for fall semester.

In item 14, the students were asked whether there is “undo” function at the level of a single action, a data entry, and a complete group of actions. Half of the in both two groups were agreed or strongly agreed with the statement. The mean value of the item was 3.49 for summer school and 3.46 for fall semester.

Item 15 was about whether each window had a title. 73.5% of the students in summer school and 82.8% of the students in fall semester were agreed or strongly agreed with the statement. The mean value was 4 for summer school and 3.93 for fall semester.

Table 4.15: Distribution of Responses for Item 8, 9, 10, 11 12, 13, 14, 15, 17, 21, 28, 29, 30, 31, 32, 37 and 39 in 2008 summer school.

Item	Percentages and Number of Responses					
	SD	D	N	A	SA	Mean
8	2 (4.1%)	2 (4.1%)	3 (6.1%)	26 (53.1%)	16 (32.7%)	4.06
9	1 (2.0%)	2 (4.1%)	10 (20.4%)	26 (53.1%)	10 (20.4%)	3.86
10	1 (2.0%)	1 (2.0%)	9 (18.4%)	27 (55.1%)	11 (22.4%)	3.94
11	1 (2.0%)	3 (6.1%)	7 (14.3%)	27 (55.1%)	10 (20.4%)	3.88
12		2 (4.1%)	10 (20.4%)	27 (55.1%)	9 (18.4%)	3.90
13	2 (4.1%)	3 (6.1%)	6 (12.2%)	24 (49.0%)	14 (28.6%)	3.92
14	2 (2.6%)	6 (12.2%)	15 (30.6%)	18 (36.7%)	8 (16.3%)	3.49
15		2 (4.1%)	10 (20.4%)	22 (44.9%)	14 (28.6%)	4.00
17	1 (2.0%)	5 (10.2%)	13 (26.5%)	20 (40.8%)	10 (20.4%)	3.67
21	1 (2.0%)	3 (6.1%)	13 (26.5%)	23 (46.9%)	8 (16.3%)	3.70
28		2 (4.1%)	6 (12.2%)	28 (57.1%)	12 (24.5%)	4.00
29		2 (4.1%)	5 (10.2%)	25 (51.0%)	15 (30.2%)	4.13
30	1 (2.0%)	7 (14.3%)	15 (30.6%)	18 (36.7%)	6 (12.2%)	3.45
31			4 (8.2%)	26 (53.1%)	18 (36.7%)	4.29
32*	1 (2.0%)	3 (6.1%)	8 (16.3 %)	23 (46.9%)	13 (26.5%)	3.91
36	11 (22.4%)	20 (40.8%)	6 (12.2%)	10 (20.4%)	1 (2.0%)	2.38
37*	1 (2.0%)	2 (4.1%)	5 (10.2%)	26 (53.1%)	14 (28.6%)	4.04
39*	14 (28.6%)	21 (42.9%)	6 (12.2%)	6 (12.2%)	1 (2.0%)	2.15
*: Reversed Item						
Sub Scale Mean Score						3.71

Table 4.16: Distribution of Responses for Item 8, 9, 10, 11 12, 13, 14, 15, 17, 21, 28, 29, 30, 31, 32, 37 and 39 in fall semester of 2008/2009 academic year.

Item	Percentages and Number of Responses					
	SD	D	N	A	SA	Mean
8		3 (10.3%)	4 (13.8%)	13 (44.8%)	9 (31.0%)	3.96
9		1 (3.4%)	7 (24.1%)	19 (65.5%)	2 (6.9%)	3.76
10		1 (3.4%)	5 (17.2%)	20 (69.0%)	3 (10.3%)	3.86
11		2 (3.4%)	6 (20.7%)	18 (62.1%)	4 (13.8%)	3.86
12			7 (24.1%)	20 (69.0%)	2 (6.9%)	3.83
13		3 (10.3%)	4 (13.8%)	18 (62.1%)	3 (10.3%)	3.75
14		2 (6.9%)	13 (44.8%)	11 (37.9%)	2 (6.9%)	3.46
15		1 (3.4%)	4 (13.8%)	20 (69.0%)	4 (13.8%)	3.93
17		1 (3.4%)	2 (6.9%)	22 (75.9%)	4 (13.8%)	4.00
21			10 (34.5%)	15 (57.1%)	3 (10.3%)	3.75
28			4 (13.8%)	19 (65.5%)	4 (13.8%)	4.00
29		1 (3.4%)	4 (13.8%)	18 (62.1%)	5 (17.2%)	3.96
30	1 (3.4%)	3 (10.3%)	8 (27.6%)	12 (41.4%)	3 (10.3%)	3.48
31		1 (3.4%)	6 (20.7%)	16 (55.2%)	5 (17.2%)	3.89
32*		3 (10.3%)	4 (13.8 %)	17 (58.6%)	4 (13.8%)	3.79
36	2 (6.9%)	17 (58.6%)	6 (20.7%)	1 (3.4%)	2 (6.9%)	2.42
37*		1 (3.4%)	7 (24.1%)	17 (58.6%)	3 (10.3%)	3.79
39*	1 (3.4%)	16 (55.2%)	5 (17.2%)	5 (17.2%)	1 (3.4%)	2.60
*: Reversed Item						
Sub Scale Mean Score						3.67

In item 17, the students were asked whether vertical and horizontal scrolling were possible in each window. The mean value of the item was 3.67for summer school

and 4.00 for fall semester. The responses of the students in two groups showed that most of the students (71.7%) were agreed or strongly agreed with the statement.

Item 21 was about messages of Moodle. In item 21, it was asked whether massages placed users in control of the system. 61.2% of the students in summer school and 67.4% of the students in fall semester were agreed or strongly agreed with the statement. The mean value of the item was 3.70 for summer school and 3.75 for fall semester.

In item 28, the students were asked whether the window operations were easy to learn and use. Most of the students (84%) in two groups were agreed or strongly agreed with the statement. The mean value of the item was the same in both summer school and fall semester, 4.00.

In item 29, it was asked whether the organization of the Moodle was easy to follow. The mean value of the item was 4.13 for summer school and 3.96 for fall semester. The mean scores showed that most of the students were agreed or strongly agreed with the statement.

Item 30 was about whether the Moodle had all the functions and capabilities a user expected from it. Only half of the students in two groups were agreed or strongly agreed with the statement. The mean value of the item was 3.45 for summer school and 3.48 for fall semester.

In item 31, it was asked whether the Moodle was easy for students to use. Mostly the students were agreed or strongly agreed with the statement. The mean value of the item was 4.29 for summer school and 3.89 for fall semester.

Item 32 was the revised version of item 13. The students were asked whether navigation was easy in Moodle. The responses of the students' showed that most of them were agreed or strongly agreed with the statement. The mean value of the item was 3.91 for summer school 3.79 for fall semester.

The item 36 was a negative statement. In item 36, it was asked whether the students spent too much time trying to log onto course web site. Only 27.9% of the students in two groups were agreed or strongly agreed with the statement. The mean value of the item was 2.38 for summer school 2.42 for fall semester.

The item 37 was revised form of item 8. In item 37, it was asked whether the students were able to access the Moodle when they needed. The mean value of the item was 3.79 for summer school and 4.04 for fall semester. The mean scores of the two groups showed that most of the students were agreed or strongly agreed with the statement.

The last item of this category was item 39 and it was a negative statement. It was revised from item 31 and the students were asked whether the students spent too much time trying to understand the Moodle and its applications. Only 26.7% of the students in two groups were agreed or strongly agreed with the statement and the mean value of the item was 2.15 for summer school and 2.60 for fall semester.

4.2.6 Help and Documentation

In the questionnaire, students' perceptions about help and documentation were gathered from the related items 25, 26 and 27. The percentages and mean value of the items were given in Table 4.17 and Table 4.18. The mean value of the items in this category was 3.56 for summer school and 3.50 for fall semester.

In item 25, it was asked whether the help function is visible. Nearly half of the students in two groups were agreed or strongly agreed with the statement. The mean score of the item was the same for both groups, 3.29.

Table 4.17: Distribution of Responses for Item 25, 26 and 27 in 2008 summer school.

Item	Percentages and Number of Responses					
	SD	D	N	A	SA	Mean
25	4 (8.2%)	7 (14.3%)	14 (28.6%)	17 (34.7%)	6 (12.2%)	3.29
26	2 (4.1%)	2 (4.1%)	6 (12.2%)	29 (59.2%)	9 (18.4%)	3.85
27	1 (2.0%)	5 (10.2%)	16 (32.7%)	19 (38.8%)	7 (14.3%)	3.54
Sub Scale Mean Score						3.56

Table 4.18: Distribution of Responses for Item 25, 26 and 27 in fall semester of 2008/2009 academic year.

Item	Percentages and Number of Responses					
	SD	D	N	A	SA	Mean
25	1 (3.4%)	4 (13.8%)	11 (37.9%)	10 (34.5%)	2 (6.9%)	3.29
26		3 (10.3%)	5 (17.2%)	16 (55.2%)	4 (13.8%)	3.75
27			16 (55.2%)	11 (37.9%)	1 (3.4%)	3.46
Sub Scale Mean Score						3.50

Item 26 was about the accessing information in Moodle. The students were asked whether the information was easy to find. 77.6% of the students in summer school 69% of the students in fall semester were agreed or strongly agreed with the statement. The mean score of the item was 3.85 for summer school and 3.75 for fall semester.

In item 27, it was asked whether it was easy to access and return from the help system. Half of the students in summer school and fall semester were agreed or strongly agreed with the statement. The mean score of the item was 3.54 for summer school 3.46 for fall semester.

4.2.7 Moodle and its Applications

4.2.7.1. Forum

In the questionnaire, students' perceptions about forum application of Moodle were gathered from the related items 43, 44, 45, 46, 47 and 50. The percentages and mean value of the items were given in Table 4.19 and Table 4.20. The mean value of the items in this category was 3.55 for summer school and 3.39 for fall semester.

Table 4.19: Distribution of Responses for Item 43, 44, 45, 46, 47, and 50 in 2008 summer school.

Item	Percentages and Number of Responses					
	SD	D	N	A	SA	Mean
43	3 (6.1%)	6 (12.2%)	7 (14.3%)	23 (46.9%)	9 (18.4%)	3.60
44	1 (2.0%)	1 (2.0%)	4 (8.2%)	29 (59.2%)	13 (26.5%)	4.08
45	6 (12.2%)	9 (18.4%)	11 (22.4%)	16 (32.7%)	5 (10.2%)	3.11
46	6 (12.2%)	7 (14.3%)	17 (34.7%)	16 (32.7%)	2 (4.1%)	3.02
47	3 (6.1%)	5 (10.2%)	11 (22.4%)	23 (46.9%)	6 (12.2%)	3.50
50		3 (6.1%)	8 (16.3%)	24 (49.0%)	13 (26.5%)	3.98
Sub Scale Mean Score						3.55

Item 46 had the lowest high score among the items related with forum application of Moodle. In item 46, the students were asked whether the students were able to receive immediate feedback through forums. The mean score of the item was 3.02 for summer school and 3.03 for fall semester. Only 35.9% of the students in both groups were agreed or strongly agreed with the statement.

Table 4.20: Distribution of Responses for Item 43, 44, 45, 46, 47, and 50 in fall semester of 2008/2009 academic year.

Item	Percentages and Number of Responses					
	SD	D	N	A	SA	Mean
43		4 (13.8%)	7(24.1%)	16(55.2%)	2(6.9%)	3.56
44		3 (10.3%)	5 (17.2%)	18 (62.1%)	3 (10.3%)	3.72
45	2 (6.9%)	6 (20.7%)	11 (37.9%)	6 (20.7%)	4 (13.8%)	3.14
46	1 (3.4%)	8 (27.6%)	10 (34.5%)	9 (31.0%)	1 (3.4%)	3.03
47		5 (17.2%)	15 (51.7%)	8 (27.6%)	1 (3.4%)	3.17
50		2 (6.9%)	8 (27.6%)	16 (55.2%)	3 (10.3%)	3.69
Sub Scale Mean Score						3.39

In item 47, it was asked whether forums improved the students' understanding of the topic. Nearly half of the students in both groups were agreed or strongly agreed with the statement. The mean score of the item was 3.50 for summer school and 3.17 for fall semester.

Item 50 was about forum application of Moodle. It was asked whether accessing the forum application in the Moodle was easy.75.5 % of the students in summer school and in fall semester were agreed or strongly agreed with the statement. The mean score of the item was 3.98 for summer school and 3.69 for fall semester.

4.2.7.2. Chat Tool

Students were asked 3 questions to understand their perceptions about chat tools of Moodle. The questions, percentages and mean value of the items were given in Table 4.21 and Table 4.22. The mean value of the items in this category was 3.07 for summer school and 3.24 for fall semester.

Item 48 it was asked whether the chat tool was very beneficial to interact online with their friends. The mean score of the item was 2.85 for summer school and 3.31 for fall semester. Only 37.2% of the students in two groups were agreed or strongly agreed with the statement.

In item 49, it was asked whether accessing chat application in the Moodle was easy. Nearly half of the students were agreed or strongly agreed with the statement. The mean score of the item was 3.19 for summer school and 3.24 for fall semester.

The item 55 was about the usage of chat tool. In item 55, it was asked whether the chat tool was easy to use and only 32.1% of the students in two groups were agreed or strongly agreed with the statement. The mean score of the item was 3.58 for summer school and 3.66 for fall semester.

Table 4.21: Distribution of Responses for Item 48, 49 and 55 in 2008 summer school.

Item	Percentages and Number of Responses					
	SD	D	N	A	SA	Mean
48	7 (14.3%)	14 (28.6%)	11 (22.4%)	11 (22.4%)	5 (10.2%)	2.85
49	6 (12.2%)	7 (14.3%)	13 (26.5%)	16 (32.7%)	6 (12.2%)	3.19
55	4 (8.2%)	8 (16.3%)	19 (38.8%)	12 (24.5%)	5 (10.2%)	3.13
Sub Scale Mean Score						3.07

Table 4.22: Distribution of Responses for Item 48, 49 and 55 in fall semester of 2008/2009 academic year.

Item	Percentages and Number of Responses					
	SD	D	N	A	SA	Mean
48	1 (3.4%)	4 (13.8%)	11(37.9%)	11 (37.9%)	2 (6.9%)	3.31
49		5 (17.2%)	13 (44.8%)	10 (34.5%)	1 (3.4%)	3.24
55		5 (17.2%)	16 (55.2%)	6 (20.7%)	2 (6.9%)	3.17
Sub Scale Mean Score						3.24

4.2.7.3. Wiki

There were 3 questions in the questionnaire to gather the perceptions of students about wiki application of Moodle. The questions, percentages and mean value of the items were given in Table 4.23 and Table 4.24. The mean value of the items in this category was 3.07 for summer school and 3.24 for fall semester.

In item 51, it was asked whether the wiki tool was easy to use. Half of the students in two groups were agreed or strongly agreed with the statement. The mean score of the item was 3.36 for summer school and 3.54 for fall semester.

In item 52, it was asked whether the wiki tool helped the learner to gain the necessary skills. The mean score of the item was 3.54 for summer school and 3.69 for fall semester. 61.5% of the students in summer school and fall semester were agreed or strongly agreed with the statement.

In item 54, it was asked whether accessing the wiki application in the Moodle was easy. 71.4% of the students in summer school and 69.0% of the students in fall semester were agreed or strongly agreed with the statement. The mean score of the item was 3.83 for summer school and 3.76 for fall semester.

Table 4.23: Distribution of Responses for Item 51, 52 and 54 in 2008 summer school.

Item	Percentages and Number of Responses					
	SD	D	N	A	SA	Mean
51	3 (6.1%)	5 (10.2%)	15 (30.6%)	20 (40.8%)	4 (8.2%)	3.36
52	4 (8.2%)	3 (6.1%)	15 (30.6%)	20 (40.8%)	4 (8.2%)	3.54
54	2 (4.1%)	1 (2.0%)	10 (20.4%)	25 (51.0%)	10 (20.4%)	3.83
Sub Scale Mean Score						3.58

Table 4.24: Distribution of Responses for Item 51, 52 and 54 in fall semester of 2008/2009 academic year.

Item	Percentages and Number of Responses					
	SD	D	N	A	SA	Mean
51	1 (3.4%)	5 (17.2%)	4(13.8%)	14 (48.3%)	4 (13.8%)	3.54
52	1 (3.4%)	2 (6.9%)	6(20.7%)	17 (58.6%)	3 (10.3%)	3.69
54		2 (6.9%)	7 (24.1%)	16 (55.2%)	4 (13.8%)	3.76
Sub Scale Mean Score						3.66

4.2.7.4. Dictionary

In the questionnaire, students' perceptions about dictionary tools of Moodle were gathered from the related items 56, 57, and 58. The percentages and mean value of the items were given in Table 4.25 and Table 4.26. The mean value of the items in this category was 3.42 for summer school and 3.38 for fall semester.

Table 4.25: Distribution of Responses for Item 56, 57 and 58 in 2008 summer school.

Item	Percentages and Number of Responses					
	SD	D	N	A	SA	Mean
56	3 (6.1%)	7 (14.3%)	14 (28.6%)	18 (36.7%)	6 (12.2%)	3.35
57	3 (6.1%)	5 (10.2%)	21 (42.9%)	11 (22.4%)	8 (16.3%)	3.33
58	2 (4.1%)	4 (8.2%)	14 (28.6%)	20 (40.8%)	8 (16.3%)	3.58
Sub Scale Mean Score						3.42

Table 4.26: Distribution of Responses for Item 56, 57 and 58 in fall semester of 2008/2009 academic year.

Item	Percentages and Number of Responses				
SD	D	N	A	SA	Mean
56	4(13.8%)	13 (44.8%)	9 (31.0%)	3 (10.3%)	3.38
57	4(13.8%)	12 (41.4%)	11 (37.9%)	2 (6.9%)	3.39
58	5 (17.2%)	12 (41.4%)	8 (27.6%)	4 (13.8%)	3.37
Sub Scale Mean Score					3.38

In item 56, it was asked whether the dictionary tool was easy to use. The mean score of the item was 3.35 for summer school and 3.38 for fall semester. Half of the students in two groups were agreed or strongly agreed with the statement.

In item 57, the students were asked whether dictionary tool helped the learner to gain the necessary skills. Only, 38.7% of the students in summer school and 44.8% of the students in fall semester agreed or strongly agreed with the statement. The mean score of the item was 3.33 for summer school and 3.39 for fall semester.

In item 58, it was asked whether accessing the dictionary application in the Moodle was easy. The mean score of the item was 3.58 for summer school and 3.37 for fall semester. More than half of the students in two groups were agreed or strongly agreed with the statement.

4.2.7.4.5 Quiz

Students were asked 6 questions to understand their perceptions towards quiz application of Moodle. Overall, the students had positive attitudes towards Moodle. The questions, percentages and mean value of the items were given in Table 4.27 and Table 4.28. The mean value of the items in this category was 4.11 for summer school and 3.98 for fall semester.

The item 59 was about usage of quiz application of Moodle. The students were asked whether the online quiz was easy to use. The mean score of the item was 4.17 for summer school and 4.14 for fall semester. 85.9% of the students in two groups were agreed or strongly agreed with the statement.

In item 60, it was asked whether the students were able to access the quiz when they needed. The mean score of the item was 3.98 for summer school 4.10 for fall semester. 79.6% of the students in summer school and 86.2% of the students in fall semester were agreed or strongly agreed with the statement.

In item 61, it was asked whether quiz application helped the learner to gain the necessary skills. 75.6% of the students in summer school and 72.4% of the students in fall semester were agreed or strongly agreed with the statement. The mean score of the item was 3.98 for summer school and 3.86 for fall semester.

In item 62, it was asked whether the quiz application improved the students' understanding of the topic. The mean score of the item was 4.15 for summer school and 3.76 for fall semester which indicated that most of the students were agreed or strongly agreed with the statement.

Item 63 had the second highest mean value in his category. In item 63, it was asked whether accessing the quiz application in the Moodle was easy. Most of the students in two groups were agreed or strongly agreed with the statement. The mean score of the item was 4.15 for summer school and 4.07 for fall semester.

Table 4.27: Distribution of Responses for Item 59, 60, 61, 62, 63, and 64 in 2008 summer school.

Item	Percentages and Number of Responses					
	SD	D	N	A	SA	Mean
59	2 (4.1%)	1 (2.0%)	3 (6.1%)	23 (46.9%)	19 (38.8%)	4.17
60	1 (2.0%)	5 (10.2%)	3 (6.1%)	24 (49.0%)	15 (30.6%)	3.98
61	3 (6.1%)		8 (16.3%)	21 (42.9%)	16 (32.7%)	3.98
62	2 (4.1%)	1 (2.0%)	5 (10.2%)	20 (40.8%)	20 (40.8%)	4.15
63	2 (4.1%)	1 (2.0%)	4 (8.2%)	22 (44.9%)	19 (38.8%)	4.15
64	1 (2.0%)	2 (4.1%)	6 (12.2%)	16 (32.7%)	23 (46.9%)	4.21
Sub Scale Mean Score						4.11

In item 64, it was asked whether the students were able to receive immediate feedback through quizzes. The mean score of the item was 4.21 for summer school and 3.93 for fall semester. The mean values of the item showed that most of the students were agreed or strongly agreed with the statement.

Table 4.28: Distribution of Responses for Item 59, 60, 61, 62, 63, and 64 in fall semester of 2008/2009 academic year.

Item	Percentages and Number of Responses					
	SD	D	N	A	SA	Mean
59			3 (10.3%)	18 (62.1%)	7 (24.1%)	4.14
60			4 (13.8%)	18 (62.1%)	7 (24.1%)	4.10
61		2 (6.9%)	6 (20.7%)	15 (51.7%)	6 (20.7%)	3.86
62		1 (3.4%)	11 (37.9%)	11 (37.9%)	6 (20.7%)	3.76
63		2 (6.9%)	3 (10.3%)	15 (51.7%)	9 (31.0%)	4.07
64	1 (3.4%)	1 (3.4%)	5 (17.2%)	14 (48.3%)	8 (27.6%)	3.93
Sub Scale Mean Score						3.98

4.2.7.4.6 Online discussion, calendar and satisfaction with Moodle and its application

In the questionnaire, students' perceptions about forum application of Moodle were gathered from the related items 53, 65 and 66. The questions, percentages and mean value of the items were given in Table 4.29 and Table 4.30. The mean value of the items in this category was 3.89 for summer school and 3.60 for fall semester.

In item 53, the students were asked whether using online discussions made the students communicate more with their classmates. Most of the students in two groups were agreed or strongly agreed with the statement. The mean score of the item was 3.44 for summer school and 3.34 for fall semester.

In item 65, it was asked that whether the calendar in the Moodle was useful. Most of the students in the survey were agreed or strongly agreed with the statement. The mean score of the item was 4.18 for summer school 3.76 for fall semester.

In the last item of the questionnaire, item 66, it was asked whether overall, the students were very satisfied with Moodle and its applications. 77.5% of the summer school students 69% of the fall semester students were agreed or strongly agreed with the statement. The mean score of the item was 3.92 for summer school for fall semester.

Table 4.29: Distribution of Responses for Item 53, 65 and 66 in 2008 summer school.

Item	Percentages and Number of Responses					
	SD	D	N	A	SA	Mean
53	4 (8.2%)	4 (8.2%)	12 (24.5%)	23 (46.9%)	5 (10.2%)	3.44
65		1 (2.0%)	10 (20.4%)	16 (32.7%)	21 (42.9%)	4.18
66	2 (4.1%)	1 (2.0%)	7(14.3%)	20 (40.8%)	18 (36.7%)	4.06
Sub Scale Mean Score						3.89

Table 4.30: Distribution of Responses for Item 53, 65 and 66 in fall semester of 2008/2009 academic year.

Item	Percentages and Number of Responses					
	SD	D	N	A	SA	Mean
53	1 (3.4%)	4 (13.8%)	10 (34.5%)	12 (41.4%)	2 (6.9%)	3.34
65	1 (3.4%)	1 (3.4%)	9 (31.0%)	11 (37.9%)	7 (24.1%)	3.76
66	1 (3.4%)	2 (6.9%)	6 (20.7%)	16 (55.2%)	4 (13.8%)	3.70
Sub Scale Mean Score						3.60

4.3 Students' Interview Results:

The researchers made an interview with 2 volunteer students who had participated the study in the 2008 summer school and 8 volunteer students who had participated in 2008-2009 fall semester. The demographic data about the students in terms of gender and their grades were given in Table 4.31 and Table 4.32. The analyses of data gathered from the interviews with 10 volunteer students were made through three phases: data reduction, data display and conclusion drawn and the results were given under three main categories.

Table 4.31: Gender and grades of students in 2008 summer school

VARIABLE	FREQUENCIES	PERCENTAGES
Gender		
Male	1	50%
Female	1	50%
Grades		
AA	1	50%
BB	1	50%

Table 4.32: Gender and grades of students in fall semester of 2008/2009 academic year

VARIABLE	FREQUENCIES	PERCENTAGES
Gender		
Male	6	75%
Female	2	25%
Grades		
AA	4	50%
BA	3	37.5%
BB	1	12.5%

4.3.1 Communication through Moodle

The participants of the interview were asked about what they thought about the communication through Moodle, whether it was easy or not. The students said that they did not use chat tool of the Moodle. However, they frequently used forum and wiki tools during the study.

All the students were emphasized the benefits of wiki tools in Moodle. At the end of the semester students were assigned to prepare a project by using wiki application. Moreover, students were allowed to use wiki during the semester whenever they wanted. They said that by wiki tools, they could see the projects of their friends and they could write comments, suggestions about their projects. According to them, wiki was one of them most important tool of Moodle and every student in the course used wiki tool frequently.

In addition to wiki, students stated that forum was very beneficial for them. They said that they could read what their friends wrote whenever they wanted. By this they could understand what their friends thought about a specific topic. Moreover, they could share the resources related with distance education in forums. Their friends uploaded the beneficial resources or wrote the link of related web sites to the forums so that every student in the course could benefit from other resources during the course. One of the students stated that;

> *We could not find specific time to meet our friends. But, we could write our question to the forum and waited for the answer. We knew that someone would read it and helped us. This was much better.*

4.3.2 User Interface, Ease of Access, User Control and Freedom in the Moodle

The participants were asked whether they encountered any problems when they were using Moodle and what was the weakness of it. The students said that they did not face any problems when they were using Moodle.

They stated that they could access the Moodle whenever they wanted. Only two out of ten students said that when they were uploading files which were big size to the Moodle, it locked up so that they could not finish their uploading process. Moreover, they stressed that when all the students were attended to take quiz at the same time it collapsed. However, when the quiz was opened about two-days-period, they did not face any problem.

Despite its benefits, students also mentioned about the weakness of the Moodle. Two students stated that Moodle just showed when a student logged in the system. However, this was not enough for them. They stated that they could not understand who was online. According to them, it should showed who was online and if a student did not use the system for a specific time like 10 minute the system showed the person as offline. Moreover, seven out of ten students emphasized that the interface of the Moodle was a bit complicated. They stated that there were lots of

links in the home page. There were items at the left and right part of the screen and the system did not emphasize the important parts of the course such as discussion, wiki, and forum. They proposed that the important parts should be highlighted in the Moodle so that they could take the students attention more. All the participants stated that if the links in the home page did not be reduced, the novice students who had basic computer usage skills could easily confuse when they were using Moodle. They may not understand which links belongs to where. However, they believed that if an orientation about how to use Moodle were given at the beginning of the semester novice students could perform better and they did not face any problem.

4.3.3 Moodle and its Applications

The participants were asked whether they satisfied with Moodle and its application and whether they recommended it or took another course given through it. All the participants said that they were satisfied with Moodle and its application and they recommended it to the other students. One of the students added that by Moodle they learnt a different environment which helped them a lot.

In addition, one student said that he analyzed course management tools as his homework for one of the course he had been attending. He emphasized that Moodle was one of the best course management tools. There were lots of language options in Moodle so that most of the people preferred Moodle. Moreover, another student said;

> *Moodle gave student ease when they were taking a course. It was independent from the instructor and you could access the resources whenever you wanted. Because of these reasons, I recommended Moodle to other people.*

However, despite the benefits, two students out of ten stated that Moodle should not be used as the only material available in the course in Turkey. They added there was not a problem related with Moodle. According to them, the infrastructure of Turkey and the characteristics of students in Turkey did not suitable for online lessons. They

stated that students in Turkey did not have enough computer knowledge so that there could be problems. Moreover students in Turkey may lack of motivation so that they did not benefit from Moodle.

One of the student said that if the course was give through Moodle, there had to be an alternative tools for Moodle. According to them, the students should communicate with the instructor through another tool. Since students could access Moodle via internet, the alternative tool should not be based on internet. In addition to that one student emphasized that not every courses were appropriate for Moodle. He said that Moodle could be affective only for some of the course like CEIT 321 Foundations of Distance Education course or programming languages.

To analyze the students' perception about Moodle deeply, the students were asked questions about the tools of Moodle. Firstly, the students were asked what they thought about quizzes, whether it was beneficial or not. All the participants liked the quiz application of Moodle. They stated that taking the quiz whenever they wanted made them feel comfortable. One of the students stated that;

> *Quiz was super. We could take the quizzes whenever we wanted. The questions were in order and we got immediate feedback after the quiz. It helped us a lot.*

Assignment and calendar were another application that every participant liked. According to students, assignment was good. There were due dates and they had to upload their homework before due dates. They stated that the calendar reminded them what they had to, which event was coming next. So they could arrange their jobs and did their homework whenever they wanted before the due date.

Table 4.33: Summary of Students Interview Results

Interview topics	Conclusions
Communication through Moodle	• Chat tools did not be used. • Wiki and forums were very beneficial. • No problem was seen in the usage of wiki and forum.
User Interface, Ease of Access, User Control and Freedom in the Moodle	• The Interface was a bit complicated. • Moodle could be easily accessed when needed. • The system should show who is online. • Important links such as wiki, quiz should be highlighted. • Novice students should be given an orientation before they use Moodle.
Moodle and its Applications	• Quiz was very beneficial since students could take the quiz whenever they want. • Students got immediate feedback in quiz. • Overall, students satisfied with Moodle and its applications and recommended it to others. • Assignment was very beneficial since they uploaded their homework whenever they wanted before the due date. • Calendar was very beneficial since it showed the upcoming events and alarmed the students to specific occasions such as due date of the homework.

CHAPTER 5

CONCLUSIONS

In this chapter, the discussion of the results, implementation and recommendations for further studies were presented.

5.1 Discussions

The purpose of this study was to understand students' perception about one of the course management systems Moodle. This is the case study carried out 49 students who were attend to CEIT321 Foundations of Distance Education course in summer school in 2008 and 29 students who attended to the same course in fall semester of 2008-2009 academic year at Computer Education and Instructional Technology at Middle East Technical University. The questionnaire was distributed to the participants of the study at the end of the summer school and fall semester. In addition to questionnaire, face-to-face interviews were conducted by 10 volunteer participants in order to understand students' perceptions, thoughts, expectations, recommendations, criticism, comments about Moodle and its applications.

5.1.1 Course, Objectives and Content of the Course CEIT321 and Online Course

The data gathered from the questionnaire showed that students' perception about the course, objectives and content of the course were positive to some extent. Most of the students in the study agreed that the objectives of the course were clear and achievable. Moreover, they thought that the course was interesting and they gained the necessary skills that were useful in their professional life. In addition, they stated that accessing online lecture notes made positive contribution to their learning. This result was expected since the students could access the lecture notes wherever and whenever they wanted by accessing Moodle via the internet. However, though most

of the students thought that online lessons were not boring and they were more convenient, they were neutral or disagreed with the statement that online lectures were better learning experiences than traditional learning. This response can be explained by looking at the number of online courses that students had taken prior to the study. Most of the students did not take any online courses before. In other words, they did not experience any online course so they may not be objective when they compare the traditional learning experiences and online learning experiences. Their responses may be changed after getting several online courses.

The results of the questionnaire showed that students had positive perceptions about Moodle. They believed that Moodle was appropriate for the course and it was a good way to learn the topics of the course. Moreover, students' perceptions about online lecture were positively increased when it was given through Moodle. The reason for this perception change is that most of the students liked Moodle. The positive perception about Moodle may cause the positive perception of students about online learning through Moodle.

Nearly half of the students in the study believed that Moodle were more advantageous than traditional learning and more than half of the students recommended online course given through Moodle.

5.1.2 Communication through Moodle

Students had positive perception about the communication opportunities that Moodle provided. Most of the participants of the study thought that Moodle provided opportunities to interact with their friends and/or their instructor.

Moore (1989) stated that learner-learner interaction and learner-instructor interaction are two essential interactions in distance education. In the researches, it is founded that the level of interaction affects the quality of the learning experience (Navarro & Shoemaker, 2000). For this reason, all the system that is used for delivering online

courses have to provide opportunities for students to interact with their classmates and instructor during the learning process. To achieve this, Moodle includes several asynchronous and synchronous communication modules such as forums, discussion boards, and chat tools. Most of the students in the survey stated that these modules were easy to use and helped them a lot in their learning process. These tools not only provide opportunities to interaction, but also help students to construct their knowledge by sharing their ideas with their classmates and instructor. Clark and Mayer (2003) stated that collaborative tools such as discussion boards, forums support learning of course content and causes knowledge management function by encouraging learners to exchange their own experiences related to the course topic. Moreover, they stressed that learning through knowledge exchange is a valuable feature of online learning.

When the students were asked which tools they used to communicate with their friends in the interview, all of the participants stated that they did not used chat tools of Moodle for communication. Instead of it, they used forums and wiki tools to interact with their friends. Students stressed that they did not need to use chat tools. If they encountered a problem during the learning process, they just wrote to the forum and waited for the answers. Blended learning environments may cause this situation. First of all, the students met every week with their friends and instructor. In these meeting, they could discuss about their problems they had encountered during the week. Moreover, most of the participants were in the same departments so that they had chance to communicate with their peers face to face.

5.1.3 Help and Prevention, Diagnose, Recover from Errors in Moodle

The results of the questionnaire distributed to the students showed that there should be improvements related with the error messages and prompts in Moodle. Nielson (1994) stressed that the error messages in any system should be expressed in plain language instead of codes, it should state the problem, and constructively suggest a

solution to solve the problem. However, the results showed that students were neutral about the error messages in Moodle. According to them, there were few error messages and they did not be warned about the error encountered whey they were using Moodle. Moreover, the system did not warn the user about the severity of their actions and it did not inform the students what steps they should follow to recover from the errors.

Since these systems may be used by the novice students who have basic computer knowledge, there must be plenty of error messages which indicated the cause and severity of error, and the needed steps to recover the error. Otherwise, the novice students may be distracted when they faced a problem while they were using Moodle and it may cause the undesired events such as decrease of students' motivation to the course.

5.1.4 User Interface, Ease of Access, User Control and Freedom in the Moodle

The students had positive perception about easement of access and freedom in the Moodle. The students' responses showed that they were able to access Moodle whenever they needed. Participants of this study thought that Moodle was easy to use and it provided opportunities to navigate easily in the system.

Çağıltay, Graham, Lim, and Craner (1999) stated that users need to clearly shown what their current location is. Moodle shows the current location of the user in every window. Moreover, they can easily jump between the pages. Although students were satisfied with the system, they had problems related with the interface of Moodle. In the interviews, the participants emphasized that there were problems with the appearance of Moodle. The system did not allow the instructor to change the color or size of the links in the system. The students said that the important links they frequently used such as wiki, forums should be highlighted to take the students attention. The system should provide opportunities to change the color and size of the links.

5.1.5 Help and Documentation

Students had positive perception about the documentation and help function of Moodle to some extent. According to Nielson (1994) stated that the system which is used without documentation is preferable. However, he stated that sometimes it may be necessary to provide help and documentation. In these situations, the information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too large.

More than 70% of the students in this study thought Moodle provide necessary help and documentation for them. The responses of the students showed that most of the students did not face problems when they tried to access the materials in Moodle and they could find the necessary information whenever they needed.

5.1.6 Moodle and its Applications

The study indicated that students' perception about Moodle and its application can be accepted as positive to some extent. Most of students in this study agreed on the applications of Moodle were helpful to gain the necessary skills.

Moodle provide valuable experiences for students in their learning process. Moodle gave the opportunities to students to study at their own rate, whenever and wherever they wanted. Moreover, students can get feedback from many resources such as forums, wiki, quizzes in Moodle. Feedback is the necessary part of a distance learning system (Schlosser & Anderson, 1994). As stated by Çağıltay, Graham, Lim, and Craner (1999), prompt feedback is the primary principle of determining the quality of instruction.

Moodle allows students to take online quizzes. According Horton (2000), taking online quizzes has most of advantages. Online test help the instructor to show the important parts of the course to the students so that learners are motivated to focus on these parts. Moreover, it helps the instructor to understand the success of parts of the

course and provide opportunities to the learner to master the certain knowledge and skills. Lynch (2002) stated that the main advantage of using a computer-marked quiz is instant feedback. According to him, that feedback can be just right and wrong marks, or it can be advice for remediation, explanations of what they did wrong, and reinforcement for what was correct. In the interview the students said that quiz application helped them much in their learning process since they could take them whenever and wherever they wanted. They stated that they could get immediate feedback from the quiz. Moodle informed the students about their performances and showed the answers of the questions when they completed the quiz.

Moodle provides opportunities for students to benefit from the advantages of wiki technologies. According to Klobas and Beesley (2006) wiki is not only a means of communicating ideas but also a resources for sharing, storing, retrieving knowledge among its members. The questionnaire distributed in this study showed that students had positive attitudes towards wiki application of Moodle. Most of the students thought that wiki was easy to access and use, and it helped them to gain the necessary skills. Moreover, in the interviews the students emphasized the benefits of wiki application. According to them wiki was one of the most important application of Moodle. They stated that it helped them to share their knowledge and gave feedback to each other.

Finally, Moodle helped the learners to managed their time in their learning process. Management of time is one of the most important skills needed for online courses. Çağıltay, Graham, Lim, and Craner (1999), states that learning results from time spending on task. Due to this reason, students need to know how to use their time well. They needed help for their time management skills. Calendar application of Moodle helps the students to develop their time management skills. Moodle includes a calendar which warns the students about the occasions of the month. Students had positive perception about the calendar application of Moodle. In the interview, they stated that calendar helped them to see what they had to do until a specific time, what

event was coming next. So that they could manage their time in order to do their assignments.

5.2 Recommendations for Practice

Some recommendations for practice can be given based on the results of this research study. The possible recommendations are presented below:

- The instructor should consider the background computer knowledge of the students who will use Moodle as the course material during the semester. As stated by the students, novice users may be confused while they are using Moodle. At the beginning of the semester, an orientation about how to use Moodle effectively should be given to the students.

- Moodle should be redesigned in order to take the students' attention. Multiple visual, textual, auditory, authentic activities should be added to improve the students' attention and enhance students learning. Instructor should add challenging activities, discussion topics, and weekly assignments in order to make the students follow the course web site and master the new concepts and skills regularly and let the students understand the concepts clearly.

- Instructor should provide discussion environments where students share and construct their knowledge. Instructor should let the students discuss about the specific content through forums or wiki to increase the knowledge of the students.

5.3 Recommendations for Future Research Studies

It is possible to provide some recommendations for further studies related with usage of Moodle in the courses.

Firstly, blended learning environment used in this study. The students have an opportunity to communicate and discuss the main points with their peers and

instructor in the traditional classroom environment. This can affect their perceptions about Moodle. The perception of the students towards Moodle can be analyzed in online lessons in which Moodle is the main source for students to interact with the content, instructor and their peers.

Secondly, this is case study in which the participants were mostly from Computer Education and Instructional Technology. Moreover, the participants described their computer knowledge level as intermediate. The same study can be conducted with participants who described their computer knowledge level as beginner and/or who attend different departments.

Lastly, in this study the perception of the students towards Moodle is examined. The same study can be conducted with the instructors. In other words, the perception of instructor towards Moodle can be examined in the future in order to understand the advantages and disadvantages that Moodle brings to instructor.

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APPENDIX A

QUESTIONNAIRE

General Information

1) I'm ☐ Female ☐ Male

2) What is your high school type?

☐ General
☐ Anatolian
☐ Private
☐ Vocational
☐ Technical
☐ Other ……

3) What department are you in?

4) What year are you in your program of study? ☐ 1 ☐ 2 ☐ 3 ☐ 4

5) What is your Cumulative GPA (Genel Ortalamanız)? : ……

6) Did you take CEIT321 Distance Education course or any course related with distance education topic before?

7) Have you used course management systems like METU Online or Moodle before?
.....

8) How many online courses have you taken before this course?
……

9) How can you define your computer knowledge level?

☐ Novice
☐ Elementary
☐ Intermediate
☐ Expert

10) About how much time did you spent EACH WEEK on this course?

☐ Less than one hour
☐ 1-2 hour
☐ 3-5 hour
☐ 6-9 hour
☐ 10-12 hour
☐ 13 or more hour

11) Do you own a computer? ☐ Yes ☐ No

12) Where is the computer that you primarily use to access the course located?

☐ Computer lab in the department
☐ Computer lab in dormitory
☐ In my dormitory room
☐ In my home/apartment
☐ Other .

Using the scale below, please indicate how strongly you agree or disagree.
SD=Strongly Disagree D=Disagree N=Neutral A=Agree
SA=Strongly Agree

About the course:	SD	D	N	A	SA
1. The course objective(s) were clear and achievable.					
2. The course was interesting.					
3. The course was appropriate for online learning.					
4. Taking an online course is more convenient.					
5. Taking an online course is boring.					
6. Online course is a better learning experience than traditional learning.					
7. Accessing online lecture notes made positive contribution to my learning.					

	SD	D	N	A	SA
General Idea about Moodle					
8. Accessing the course materials from the Moodle was easy.					
9. In multi page data entry screen each page is labeled to show its relation to others.					
10. Every display begins with a title or header that describes screen contents.					
11. Graphic User Interface menus make which item has been selected obvious.					
12. On data entry screens, tasks are described in terminology familiar to users.					
13. It is easy for users to switch between the windows in Moodle.					
14. There is “undo” function at the level of a single action, a data entry, and a complete group of actions.					
15. Each window has a title.					
16. In the Moodle prompts are stated constructively, without overt or implied criticism of the user.					
17. Vertical and horizontal scrolling possible in each window.					
18. The Moodle prevents users from making errors whenever possible.					
19. The Moodle warns users if they are about to make a potentially serious error.					

20. The Moodle provided access to instructor or other students.					
21. Messages place users in control of the system.					
22. Error messages inform the user of the error's severity.					
23. Error messages states the cause of the problem.					
24. Error messages indicate what action the user needs to take to correct the error.					
25. Help function is visible.					
26. Information is easy to find.					
27. It is easy to access and return from the help system.					
28. Window operations are easy to learn and use.					
29. Organization of the Moodle is easy to follow.					
30. The Moodle has all the functions and capabilities a user expects from it.					
31. The Moodle was easy for students to use.					
32. Navigation is easy in Moodle.					
33. I would recommend taking an online course given through Moodle to friends or associates.					
34. Online courses through the use of Moodle were more advantageous than traditional learning.					
35. I gained skills that are useful in my actual or chosen profession.					
36. I spent too much time trying to log onto the course web site.					

37. I was able to access the Moodle when I needed.					
38. It was very easy to conduct online discussion in the Moodle.					
39. I spent too much time trying to understand the Moodle and its applications.					
40. The Moodle was a good way to learn the topics of the course.					
41. I would not take another online course which is given through Moodle.					
Features of Moodle					
42. There were sufficient opportunities to interact with classmates online in Moodle.					
43. The forum was very beneficial to understand each other's ideas.					
44. The forum was easy to use.					
45. I used the forum very frequently to communicate with other friends.					
46. I was able to receive immediate feedback through forums.					
47. Forums improved my understanding of the topic.					
48. The chat tool was very beneficial to interact online with my friends.					
49. Accessing chat application in the Moodle was easy.					
50. Accessing the forum application in the Moodle was easy.					
51. The wiki tool was easy to use.					

52. The wiki tool helps me to gain the necessary skills.					
53. Using online discussion made me communicate more with my classmates.					
54. Accessing the wiki application in the MOODLE was easy.					
55. The chat tool was easy to use.					
56. The dictionary tool was easy to use.					
57. The dictionary tool helps me to gain the necessary skills.					
58. Accessing the dictionary application in the Moodle was easy.					
59. The online quiz was easy to use.					
60. I was able to access quiz when I needed.					
61. The quiz application helps me to gain the necessary skills.					
62. The quiz application improved my understanding of the topics.					
63. Accessing the quiz application in the Moodle was easy.					
64. I was able to receive immediate feedback through quizzes.					
65. The calendar in the Moodle was useful.					
66. Overall I was very satisfied with Moodle and its applications.					

Any Other Comments……..

APPENDIX B

INTERVIEW GUIDE FOR STUDENTS

Arkadaşlar bu dönem almış olduğunuz Ceit 321 dersi, çevrimiçi öğretimin yüzyüze öğretimle harmanlanması ile gelitirilmiştir. Bende bu durum çalışması ile ilgili olarak izin verirseniz sizlerin Ceit 321 dersi hakkındaki görüşlerinizi almak istiyorum. Bu görüşmede verdiğiniz bilgiler sadece araştırma için kullanılacaktır. Görüşlerinizi belirterek bu araştırmaya yaptığınız katkıdan dolayı şimdiden teşekkürler.

1. Moodle ile ders alırken karşılaştığınız bir sorun oldu mu?

2. Moodle araçlarından (tartışma, wiki gibi) en çok hangilerinin kullandınız? Bunlar hakkında neler düşünüyorsunuz?

3. Derste Moodle aracını kullanmaktan memnun kaldınız mı?

4. Öğretmeniniz ve arkadaşlarınızla Moodle sayesinde iletişiminiz hakkında neler düşünüyorsunuz?

5. Moodle ile ders almayı arkadaşlarınıza tavsiye eder misiniz?

6. Moodle da eksik gördüğünüz ve düzeltilmesini istediğiniz, tavsiyeleriniz nelerdir?

7. Son olarak programın değerlendirmesine yardımcı olmak için eklemek istediğiniz herhangi bir şey var mı?

APPENDIX C

PARTICIPANT INFORMED CONSENT FORM

Dear Student

The purpose of this study is to gather information about students' perceptions towards one of open source course management systems Moodle and its application. It is particularly important to obtain your responses because your experiences help us to decide the effectiveness of the Moodle. It is requested to fill a checklist than contains 66 items. It only takes 30 minutes to fill the checklist. It is also requested to give answers to seven questions which you can finish in 20 minutes. The aim of the interview is to get more detailed information about your experiences with Moodle. The interview will be recorded. You are not asked to write your name in checklist or in interview. Your responses will be kept confidential.

It is important to participate this study voluntarily. If you do not want you do not have to fill the checklist or interview with the researcher. If you want to participate please signature this form.

Thank you very much for your cooperation and for being such an important part of this study.

Sincerely,

Neşe Sevim

Master student of METU CEIT

Address: EF 23 Faculty of Education- METU

Mail: nsevim@metu.edu.tr