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Communication and Collaboration, Satisfaction, Equity, and Autonomy in Blended Learning Environments: A Case from Turkey

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Abstract

Research studies conducted in the area of e-learning and blended learning lead to the emergence of new concepts, which directly influence quality. Among these concepts, the ones taken into consideration for this research study are as follows: communication and collaboration, satisfaction, equity, and autonomy. The perceptions of students taking blended ICT courses in a private university in Turkey were gathered through an Online Learning Environment Survey (OLES). Additionally, the suggestions of instructors for improving the quality of blended learning were obtained through a focus group interview.

The findings of this study show that the perceived communication, collaboration, and satisfaction levels of students vary according to their levels of computer and Internet literacy. Also, there are differences in the students' satisfaction levels based on gender. The majority of students revealed that they considered themselves to be autonomous and equal in the blended learning environment.

The findings of this research study, together with our review of recent literature, lead us to conclude that there are four major areas (containing several factors) that must be considered when developing a high-quality blended learning environment: technology, instructors, students, and pedagogy. Based on the findings, some practical suggestions for transforming traditional courses into blended ones are also offered at the end of the research study. Finally, suggestions for the future are provided.

Introduction

The latest technologies are widely used in most educational institutions. There are three common approaches to usage: support to traditional instruction, blended learning, and e-learning. Among these alternatives, blended learning is the most prevalent since it possesses the advantages of both traditional instruction and e-learning (Horton, 2000). Also known as hybrid instruction, blended learning combines the strengths of classroom techniques with those of Web-based training. Thus, the content may be delivered in both ways; the teaching-learning process takes place in the

classroom and the virtual environment; and stakeholders can communicate face-to-face and online. Moreover, a blended learning environment provides various communication possibilities for all participants, provides easy access to instructional materials, enhances equity during the teaching-learning process, gives students the freedom to study independently, and improves quality by supplying a technology-rich learning environment (Anderson & Elloumi, 2004; Rosenberg, 2001; Horton & Horton, 2003; Rudestam & Schoenholtz-Read, 2002).

Although in blended types of courses, face-to-face and technology-based learning opportunities are combined for effective use, there is no formula for aligning time and technology in a precise way. While some instructors prefer to conduct face-to-face lessons each week, others prefer to come together two or three times within a semester. The ultimate goal of a hybrid course is to combine the best features of classroom teaching with the best features of e-learning to create active, self-directed, and flexible learning opportunities (Garnham & Kaleta, 2002). It should be acknowledged, however, that various fusions of time and technology bring both benefits and challenges.

The Pros and Cons of Blended Learning

The blending of different learning opportunities for effective learning begins with redesigning existing courses. The content has to be developed, the syllabus has to be reorganized in a detailed way, and the delivery methods have to be scheduled. For instructors, transforming, redesigning, and publishing information on the Web involves two key demands: (a) decision-making about which content will be transferred to the online environment and how it will be presented, and (b) technical competence in uploading the content or creating new Web documents. Parallel with this process, students have to find new learning and study strategies to adapt to this enhanced learning environment, and they have to develop computer literacy to effectively use the system and overcome technical problems. Thus, the roles of instructors and students change since they must make optimum use of what is offered to them (Fresen, 2007).

There are many questions that need to be answered when organizing a hybrid course: What should be done at the curriculum level? What is the role of instructional designers in this process? Which technologies are effective, when, and how? Fresen (2007) offers a taxonomy of critical success factors for quality Web-supported learning, which was derived from a comparative analysis of the literature. The researcher categorized these factors under six headings: institutional factors, technology factors, lecturer factors, student factors, instructional design factors, and pedagogical factors. Fresen also highlights the impact of issues such as accessibility, learner-centered environments, change management, and the quality of Web-supported learning products, and she underlines the importance of identifying the most important factors as well as the priorities for quality improvement.

Instructors, students, and administrative staff are the stakeholders in blended learning, but the benefits and challenges will be different for each (Bonk & Graham, 2008). From the students' perspective, flexibility of time and place may be a benefit; whereas, the necessity of becoming self-directed learners, taking greater responsibility for their own learning, and using complex

technologies like learning and content management systems (Vaughan, 2007; Moore & Kearsley, 2004; Welker & Berardino, 2006) are the challenges. From an instructor's perspective, being independent from time and place, providing technology-enhanced opportunities, and increasing communication may be benefits, but the extra time needed to design hybrid courses and acquire new teaching and technology skills as well as the experiences before, during, and after the course are the challenges (Rosenberg, 2001; Simonson, Smaldino & Zvacek, 2002). From the administrative point of view, although blended learning and technology-based opportunities contribute to the reputation of the institution and provide cost-effectiveness, administrators are challenged by resistance to change, inadequate infrastructure, and instructors' lack of technical competency (Vaughan, 2007; Simonson, Smaldino, & Zvacek, 2002; Palloff & Pratt, 2001).

Concepts that Influence the Quality of E-Learning and Blended Learning Environments

Research studies conducted in the area of e-learning and blended learning lead to the emergence of new concepts, which directly influence quality (Mouzakis, 2008; Blankson & Kyei-Blankson, 2008). Among these concepts, the ones taken into consideration for this research study are as follows: *communication* and *collaboration*, *satisfaction*, *equity*, and *autonomy*.

Communication is perhaps the most important factor in e-learning. Most research studies have indicated that no communication tools have been found to be as effective as face-to-face interaction (So & Brush, 2008; Darian, 2008). For this reason, the lack of interaction in e-learning environments has been criticized. To overcome this obstacle, many solutions have been provided and tested. Interactive applications, increased collaboration, cooperative learning, and recent web 2.0 technologies, such as blogs and wikis, not to mention forums, listservs, and chat sessions, are all ways of increasing communication and interaction among the stakeholders in e-learning. So and Brush (2008) state that "students who perceived high levels of collaborative learning tended to be more satisfied with their distance course than those who perceived low levels of collaborative learning" (p. 318). The researchers concluded that the communication medium was one of the critical factors associated with student perceptions of collaborative learning and satisfaction. Gerber, Grund, and Grote (2007) point out the importance of communication by stating that "not only tutors' interpersonal, but also students' own content-related and interpersonal messages had an impact on students' learning performance" (p. 232). Delialioglu and Yildirim (2008) also underline the importance of two-way communication features provided in e-learning environments and stress the importance of the use of new technologies like e-mail, chat, and teleconferencing tools to enhance quality since "integrating such new technologies into hybrid/blended instruction may eliminate the problems of one way communication" (p. 482). Kim (2008) also states that e-mail messages in support of effective, efficient, and engaging learning may be transformative in e-learning. Blended learning approaches provide students ways to communicate and interact with their instructors and classmates both online and offline (Allen & Seaman, 2003).

Self-directed learning has been underlined by many researchers as important to student success in e-learning environments (Simonson, Smaldino, & Zvacek, 2002; Moore & Kearsley, 2004). According to Osguthorpe and Graham (2003), "if students are to develop a sense of self-directedness in their learning, they need to be given the opportunity to make choices, nontrivial decisions about what they will study and how they will study it" (p. 231). Facilitating student autonomy is an important consideration when designing blended learning environments.

The concept of equity encompasses the tutors' behaviors towards students. The scope of the concept in this study was based on the answers given to such questions as the following: are the tutors fostering a democratic environment and behaving equally towards all students? Do they value all of the homework? Do they encourage all students in a similar and equal manner in discussion environments? The tutors, especially those who have previous online experience, directly influence the quality of the blended learning environment (Wheeler, 2001). Also, as noted by Sulčič and Sulčič (2007), "Only well-trained tutors will be able to satisfy student expectation about the quantity, frequency and quality of learning supporting activities" (p. 209). These researchers conclude that well educated tutors bestowed with the necessary skills are able to improve the quality of e-learning.

The final concept to be examined in this study is satisfaction, and it may change based on variables in the learning process. Tutors, other students, administrative staff, technological, and pedagogical issues all affect students' level of satisfaction with the blended learning environment.

Learning and Content Management Systems (LCMS)

An LCMS is the best solution for managing the online educational process. Blended learning involves a complex structure, which consists of the advantageous components of traditional (face-to-face) and online learning. LCMSs are becoming a solution for blended learning. Presently, there are many LCMSs on the market. These applications are categorized into two major groups: commercial products and open-source projects. We can add in-house LCMSs, which are designed by institutions themselves, as a third group. Before implementing blended learning, institutions make a decision about their road map. If they have enough resources – qualified manpower and technical infrastructure – they will prefer to develop applications themselves. On the other hand, a combination of the three groups is an option. Naturally, institutions desire an excellent system; nevertheless, any of the above mentioned LCMS solutions may not be adequate by itself. Thus, combining options is often the best solution.

In this study, we designed and developed most of the LCMS in-house. Some parts of the system, such as the chat module, are commercial products, and some parts of the system, such as the content editor, are open-source. This way of working gives us the opportunity for rapid development and enables us to focus on the educational design process.

The ultimate goal of any blended learning approach, as stated by Osguthorpe and Graham (2003), is "…to find a harmonious balance between online access to knowledge and face-to-face human interaction" (p. 228). On the other hand, the balance between online and face-to-face learning

activities, instructional strategies, the level of interaction, and assessment preferences will be different for every course. Delfino and Persico (2007) also underscore how solutions for blended environments "include a highly flexible course design and a good balance and strict integration between traditional and online training techniques in the delivery of the course and in the assessment of trainees" (p. 351). Hence, the quality of any blended learning environment will depend on the balance and harmony between the components offered to students.

In the private university in Turkey that is the focus of this research study, all the courses that aim to equip students with ICT skills are standardized, and students engage in these courses in blended learning environments. The previous course structure was composed of four hours a week, where two hours were allotted for theoretical knowledge and two hours for application of knowledge. The blended learning environments are arranged in such a way that students receive one hour of face-to-face lessons per week. All the remaining content, activities, and discussions are carried out in virtual environments. For the virtual learning environment, an in-house Learning and Content Management System (LCMS) was used. Listed below are the minimum features of an LCMS, as recorded in the literature (Al & Madran, 2004) and guided by the authors' previous experience, and the system developed in-house contains all of these features:

1. *User Management*. Administrators can add new users, delete or modify user information, and change user rights.
2. *Content Creation*: Course materials are created and modified using the embedded Web-based editor. This editor also allows file upload to create rich content.
3. *Course Management*: Instructors can create new courses, delete courses, modify course information, and add course content.
4. *Customizable Course Environments*: Every course is configured as standalone, which enables customizability, for example, activating/deactivating interactive course content, publishing course resources, etc.
5. *Communication and Collaboration Tools Management*: Instructors can create new chat rooms, record and publish chat sessions, and send announcements to learners.
6. *Drill and Practice Management*: Instructors can design drill and practice tools and easily put them on the course home page. Also, they can give feedback and mark learners' submitted work.
7. *Assessment Management*: Instructors can make arrangements for partial points for different homework assignments and projects as well as monitor student progress.
8. *System Monitoring and Reporting*: Every activity within a LCMS, such as chat sessions, messages, forum entries, and user logins and logouts are monitored. Additionally, administrators can create reports about activities whenever they want.

Design of the In-House LCMS

Before setting up the system design, the analysis stage must be accomplished. Needs analyses are helpful in creating a design framework. The LCMS design process has two main areas of focus: the technical infrastructure and the learning environment. In this study, we used mainly open-source platforms for the technical infrastructure. The Adobe Flash authoring language, which is a

very popular commercial product, was used for the learning environment (Table 1). For more information about the in-house LCMS used in this study, see the Appendix.

Table 1

Technical Infrastructure and Learning Environment

	Platform	**License Type**
Web Server	Apache	Open-Source
Scripting Language	PHP	Open-Source
Database Server	MySQL	Open-Source
Learning Environment includes • **Chat Rooms,** • **Virtual Classes, and** • **Interactive Learning Content**	Adobe Flash	Commercial

Method

Qualitative and quantitative research techniques were employed for this research study. The perceptions of students were gathered through an Online Learning Environment Survey (OLES). Additionally, the suggestions of instructors for improving the quality of blended learning were obtained through a focus group interview. By doing this, the researchers tried to answer the following research questions:

1. To what extent did the perceived communication and collaboration skills of students vary according to their level of computer usage, level of Internet usage, frequency of computer usage, and frequency of Internet usage?
2. To what extent were students satisfied with the blended learning environment according to gender, their level of Internet usage, frequency of computer usage, and frequency of Internet usage?
3. What were the perceptions of students about student equity in the blended learning environment?
4. What were the perceptions of students about student autonomy in the blended learning environment?
5. What were the perceptions of instructors about their experience teaching in the blended learning environment?

Participants

The ICT courses were offered in ten distinct faculties and high schools during the 2007-2008 fall semester. A total of 910 students enrolled in the hybrid/blended courses. There were 49 sections, carried out by 27 instructors during that time. All of the students and instructors conducted the lessons in a parallel way, based on a standardized syllabus, content, and activities. Instructors

were given in-service training regarding pedagogical concerns and the use of the LCMS before implementation. The courses were offered by the instructors of the relevant departments. Of the 910 students, 374 volunteers who answered the questionnaire formed the sample for this study. As well, data was obtained from 16 instructors during a focus group interview.

Data Collection Methods

To gather data about students' views on the teaching-learning process, an Online Learning Environment Survey (OLES), originally developed by Walker (2002), was used. The scale was translated into Turkish by Özkök and Büyüköztürk (2005). A reliability and validity analysis was conducted by the researchers, and the reliability coefficient for this study was found to be 0.95. The survey was composed of 9 scales, other than demographics, with a total of 73 questions. The topics in the survey were as follows: computer usage, instructor support, communication and collaboration, personal relevance, authentic learning, student autonomy, equity, asynchronicity, and satisfaction.

Demographic information was solicited, such as gender, the presence of a computer at home, the existence of an Internet connection at home, level of computer usage, level of Internet usage, frequency of computer usage, and frequency of Internet usage. Among the nine scales, only four were investigated for this research study: the communication and collaboration scale consisted of six questions, the student autonomy scale consisted of five questions, the equity scale consisted of seven questions, and the satisfaction scale consisted of six questions.

At the end of the semester, a focus group interview was conducted with instructors in order to attain more detailed views and information about their experiences. A total of 16 instructors attended the interview. The interview lasted two hours because a discussion ensued, in which suggestions were provided related to the obstacles the instructors faced during the semester. Quantitative and qualitative results were obtained from both students and instructors.

Data Analysis

Statistical analysis methods, such as descriptive analysis, frequency analysis, t-test and ANOVA, were used to evaluate the data gathered from the questionnaire. Other statistical analysis methods were used when necessary. The interview results were analyzed through qualitative techniques. The focus group interviews were recorded and transcribed. Emerging themes were formed by the researchers then these themes were agreed upon and the analysis results were reported.

Findings

Findings for the Communication and Collaboration Factor (D)

The mean score for the communication and collaboration subscale was found to be M = 3.96, sd = .90. Significant mean differences were found between the perceived communication and

collaboration skills of students and their level of computer usage, level of Internet usage, frequency of computer usage, and frequency of Internet usage. The results of communication and collaboration subscale points regarding the level of computer usage are presented in Table 2.

Table 2

ANOVA Results of Communication and Collaboration Subscale Points regarding the Level of Computer Usage

	Sum of Squares	df	Mean Square	F	p
Between Groups	10.167	2	5.309	6.688	.001
Within Groups	294.502	371	.794		
Total	305.120	373			

The results of the analysis showed that there is a significant difference between the perceived communication and collaboration skills of students in terms of level of computer usage. In other words, the communication and collaboration skills of students vary based on their level of computer usage. According to the results of the Scheffe test, those who perceived themselves as expert (X = 4.28) have higher perceived communication and collaboration skills than the two other groups, namely beginner (X = 3.45) and intermediate (X = 3.74). Thus, it can be concluded that the students' perceived communication and collaboration skills are affected by their level of computer usage.

The results of the communication and collaboration subscale points regarding the level of Internet usage is presented in Table 3.

Table 3

ANOVA Results of Communication and Collaboration Subscale Points regarding the Level of Internet Usage

	Sum of Squares	df	Mean Square	F	p
Between Groups	15.831	2	7.916	10.151	.000
Within Groups	289.288	371	.780		
Total	305.120	373			

The results of the analysis showed that there is a significant difference between the self-reported communication and collaboration skills of students in terms of level of Internet usage. In other words, the perceived communication and collaboration skills of students vary based on their level of Internet usage. According to the results of the Scheffe test, those who perceived themselves as expert (X = 4.05) and intermediate (X = 3.74) perceive themselves to have higher communication and collaboration skills than beginners (X = 3.25). Thus, these results can be explained as indicating that the perceived communication and collaboration skills of students rose as their use of the Internet increased.

The results of the communication and collaboration subscale points regarding the frequency of computer usage is presented in Table 4.

Table 4

ANOVA Results of Communication and Collaboration Subscale Points regarding the Frequency of Computer Usage

	Sum of Squares	df	Mean Square	F	p
Between Groups	18.191	2	9.095	11.760	.000
Within Groups	286.929	371	.773		
Total	305.120	373			

The results of the analysis showed that there is a significant difference between the communication and collaboration skills of students in terms of frequency of computer usage. In other words, the perceived communication and collaboration skills of students vary based on the frequency of computer usage. According to the results of the Scheffe test, those who use computers frequently (X = 3.85) and sometimes (X = 3.56) have perceptions of higher communication and collaboration skills than those who use computers rarely (X = 3.01). Thus, these results indicate that the perceived communication and collaboration skills of students rose with increased frequency of computer use.

The results of the communication and collaboration subscale points regarding the frequency of Internet usage is presented in Table 5.

Table 5

ANOVA Results of Communication and Collaboration Subscale Points regarding the Frequency of Internet Usage

	Sum of Squares	df	Mean Square	F	p
Between Groups	17.581	2	8.790	11.342	.000
Within Groups	287.539	371	.775		
Total	305.120	373			

The results of the analysis also showed that there is a significant difference between the perceived communication and collaboration skills of students in terms of frequency of Internet usage. Put another way, the communication and collaboration skills of students vary based on the frequency of Internet usage. According to the results of the Scheffe test, those using the Internet frequently (X = 3.83) and sometimes (X = 3.57) have perceptions of higher communication and collaboration skills than those who use the Internet rarely (X = 2.92). Thus, these results suggest

that the perceived communication and collaboration skills of students increased as the frequency of Internet usage increased.

Findings for the Satisfaction Factor (I)

The mean score for the satisfaction subscale was found to be M = 3.17, Sd = 1.25. The results of the satisfaction subscale were analyzed according to gender. The results are presented in Table 6.

Table 6

T-Test Results for Gender about Satisfaction

Gender	**N**	**X**	**S**	**Sd**	**t**	**p**
Female	270	3.04	1.25	372	3.34	.001
Male	104	3.51	1.24			

It was found that there is a significant mean difference in satisfaction related to gender [$t_{(372)}$ = 3.34, p<.01]. Male students are more satisfied with the blended learning environment (X = 3.51) than female students (X = 3.04). This finding indicates a meaningful relationship between satisfaction and gender and may be related to cultural issues. On the other hand, no significant difference was found between communication and collaboration, equity, autonomy, and gender.

The results of the satisfaction subscale points regarding the level of Internet usage is presented in Table 7.

Table 7

ANOVA Results of Satisfaction Subscale Points regarding the Level of Internet Usage

	Sum of Squares	df	Mean Square	F	p
Between Groups	39.875	2	19.938	13.549	.000
Within Groups	545.948	371	1.472		
Total	585.823	373			

The results of the analysis showed that there is a significant difference between the satisfaction levels of students in terms of the level of Internet usage. In other words, satisfaction among students shows variation based on the level of Internet usage. According to the results of the Scheffe test, those who perceived themselves as expert (X = 3.34) and intermediate (X = 3.06) have higher satisfaction rates related to the blended learning environment than beginners (X = 2.42). Thus, satisfaction varies according to the level of Internet usage.

The results of the satisfaction subscale points regarding the frequency of computer usage is presented in Table 8.

Table 8

ANOVA Results of Satisfaction Subscale Points regarding the Frequency of Computer Usage

	Sum of Squares	df	Mean Square	F	p
Between Groups	25.076	2	12.538	8.295	.000
Within Groups	560.747	371	1.511		
Total	585.823	373			

The results of the analysis showed that there is a significant difference between the satisfaction levels of students in terms of the frequency of computer usage. Satisfaction among students shows diversity based on the frequency of computer usage. According to the results of the Scheffe test, those who use computers frequently (X = 3.36) and sometimes (X = 3.02) have higher satisfaction rates than those who use computers rarely (X = 2.36). Thus, these results indicate that the satisfaction of students related to the blended learning environment increases according to the frequency of computer usage.

The results of the satisfaction subscale points regarding the frequency of Internet usage is presented in Table 9.

Table 9

ANOVA Results of Satisfaction Subscale Points regarding the Frequency of Internet Usage

	Sum of Squares	df	Mean Square	F	p
Between Groups	25.250	2	12.625	8.356	.000
Within Groups	560.572	371	1.511		
Total	585.823	373			

The results of the analysis also showed that there is a significant difference between the satisfaction levels of students related to the frequency of Internet usage. Satisfaction among students therefore shows diversity based on the frequency of Internet usage. According to the results of the Scheffe test, those who use the Internet frequently (X = 3.34) and sometimes (X = 3.01) have higher satisfaction rates than those who use the Internet rarely (X = 2.27). Thus, these results show that the satisfaction of students with the blended learning envirnoment increased as Internet usage increased.

To give a basic example, the frequencies for the sixth question of the satisfaction subscale are presented in Figure 1. The sixth question was: “I am satisfied from this blended course”.

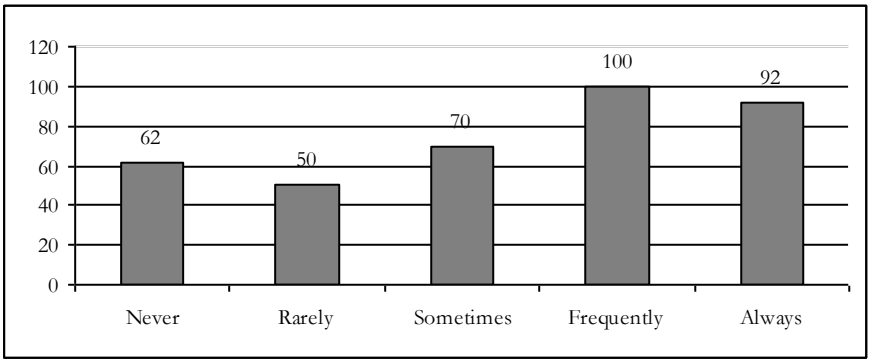

Figure 1. Frequencies for the question "I am satisfied from this blended course."

In general students seem to be satisfied with the blended environment. Of course, there are students who are dissatisfied with this environment. Future research should investigate the underlying reasons for this dissatisfaction through qualitative measures.

Findings for the Equity Factor (H)

Students' answers on equity had the highest mean score among all of the variables (M = 4.36, Sd = .76). The answers given to the questions revealed that instructors treated all students equally in all kinds of learning and discussion environments. To provide an example, the answers given to the question "Instructors provide equal opportunities to all students" can be seen in Figure 2.

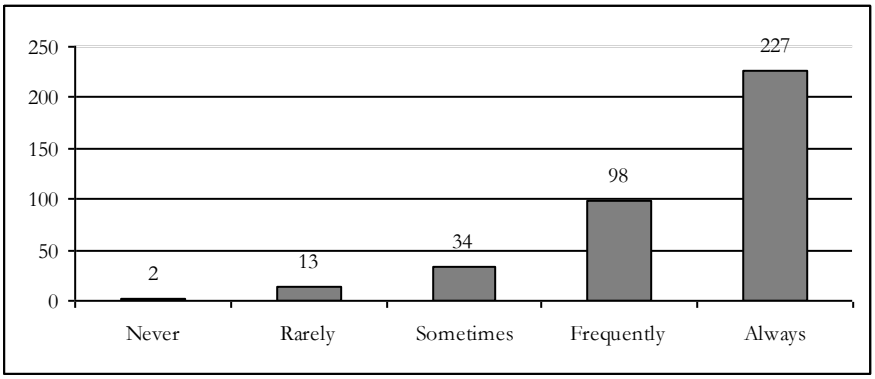

Figure 2. Frequencies for the question "Instructors provide equal opportunities to all students."

Although most of the students thought that the instructors provided equal opportunities to them, what caused some of the students to respond negatively to this question needs further exploration through qualitative research techniques, such as interviews or observations.

Findings for the Student Autonomy Factor (G)

The mean score for the student autonomy subscale was found to be (M = 4.01, Sd = .73). For example, the frequencies for the first question of the student autonomy subscale are presented in Figure 3. The sixth question was, "I make my own decisions on what to learn and how to learn."

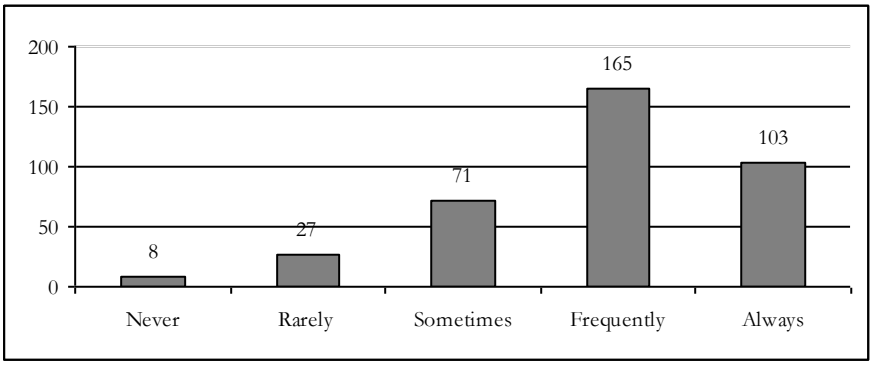

Figure 3. Frequencies for the question "I make my own decisions on what to learn and how to learn."

The overall findings indicated that approximately 70 % of students are satisfied with this new learning experience.

Findings for Suggestions of Students and Instructors

The suggestions of students regarding the blended learning approach are presented in Table 10 together with the number of students.

Table 10

Students' Suggestions about the Blended Learning Approach

Suggestions	**# of Students**
Learning approach is good and successful	58
Communication should be increased via forum and chat environments	39
Face-to-face course hours should be increased	35
Homework, projects, and applications based on research should be increased	29
Content should be enhanced in terms of visual elements	13

Based on the obstacles they faced during the implementation of blended learning, instructors' suggestions were mainly concerned with the improvement of the Learning and Content Management System. Their suggestions for improving the system were as follows:

1. Communication tools should be used more frequently.
2. Instructors should see the total reports for each student.
3. Both content and due date of homework and projects should vary according to the faculties (no standardization is necessary among faculties).
4. Content should be modified to provide more visualization and interaction.
5. Homework should be based on more authentic and open-ended problems/topics.

Conclusion and Discussion

In this research study, we gathered data about students' and instructors' perspectives on their blended learning experience. We examined the effects of Internet and computer level and usage as well as gender on the perceived communication, collaboration, and satisfaction levels of students in a blended learning environment. We also researched the students' perceptions about student equity and autonomy in the blended learning environment. The findings show that the perceived communication, collaboration, and satisfaction levels of students vary according to their levels of computer and Internet literacy. Also, there are differences in the students' satisfaction levels based on gender. The majority of students revealed that they considered themselves to be autonomous and equal in the blended learning environment. However, equity and autonomy factors had no relationship with the other factors.

The findings of this research, together with our review of recent literature, lead us to conclude that there are four major areas (containing several factors) that must be considered when developing a high-quality blended learning environment. These four areas are as follows: technology, instructors, students, and pedagogy. Detailed factors related to the four areas are presented in Figure 4.

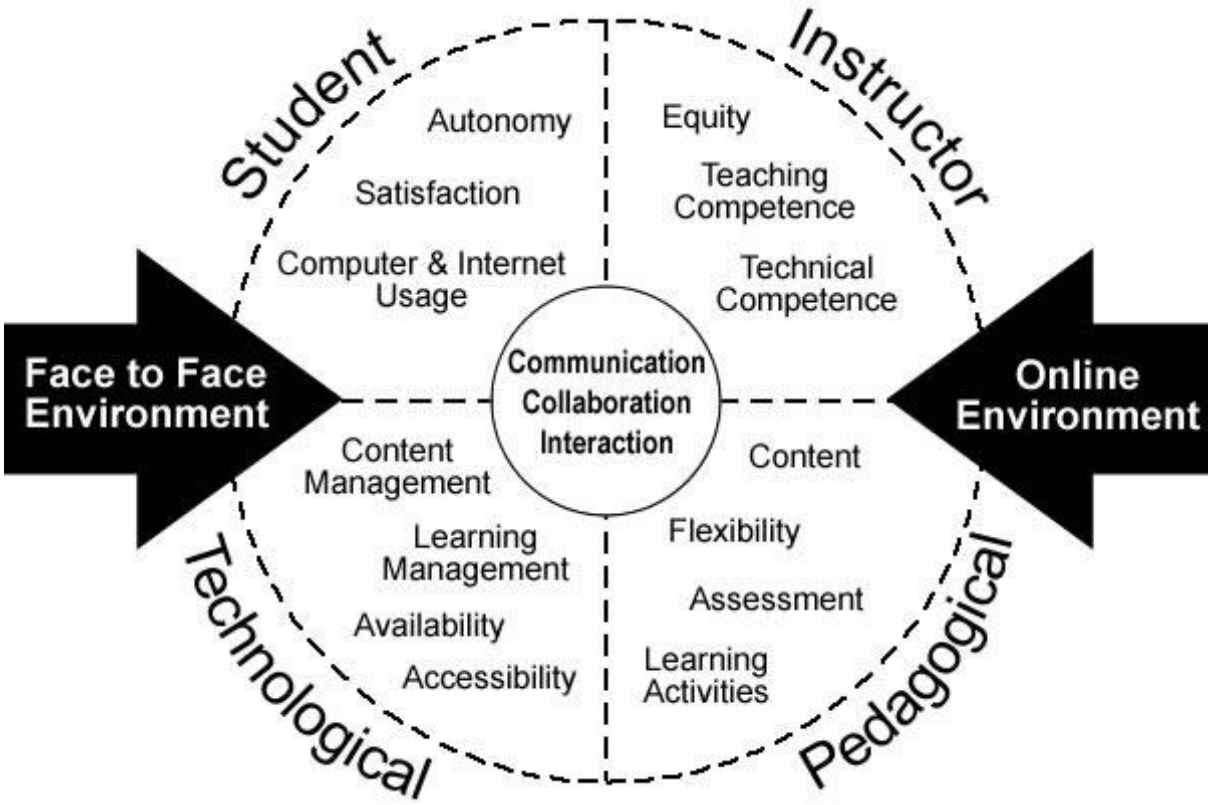

Figure 4. Blended learning components.

The four areas are equally important. From the instructors' point of view, teaching and technical skills as well as creating a democratic learning environment for students are of vital importance.

From the students' point of view, the important factors are becoming technically competent and taking responsibility for their own learning. Pedagogically, students should be provided with technically and visually rich learning and assessment activities and opportunities to increase their technical competence. At the core of the blended learning components are the communication, collaboration, and interaction factors, which are important for all areas.

In terms of instructional and system design as well as working with instructors, here are a few practical suggestions for transforming traditional courses into blended ones:

1. Instructors should be given in-service training about online pedagogical concerns and use of the LCMS.
2. Existing content should be adapted to instructors' own online environment, or totally new content should be designed and developed by considering learning goals, learning activities, and assessment strategies.
3. Ongoing assessment should be conducted and, if necessary, modifications should be made based on the continuous feedback provided by the instructors during the implementation. Thus, system developers and instructors should work together.
4. A meeting should be conducted with all of the instructors to reveal the obstacles they faced during the semester and their suggestions taken into account in order to enhance the blended learning environment to increase teaching effectiveness.

Future research studies might focus on how to effectively integrate face-to-face and online learning environments since "The need to provide more engaged learning experiences is at the core of the interest in blended learning" (Garrison & Vaughan, 2006, p. 4). Researchers should attempt to reveal the concepts underlying blended learning environments in terms of four basic areas, namely technology, pedagogy, instructors, and students. There are too many variables effecting the success of the teaching-learning process. Although many of them have been taken into consideration in many research studies, new research studies should contribute to overcoming existing barriers in order to reach a high level of achievement for all stakeholders.

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Appendix

The index page is the entrance to the LCMS. In this page there are three main parts: A, B and C (Figure 1). Part A is the users' login area, part B is the password request area, and part C is the notice for system requirements. Additionally, there is a minor navigation panel at the top-right of the page. The navigation panel includes these links: Index Page, Course Catalogue, Contact, and Help.

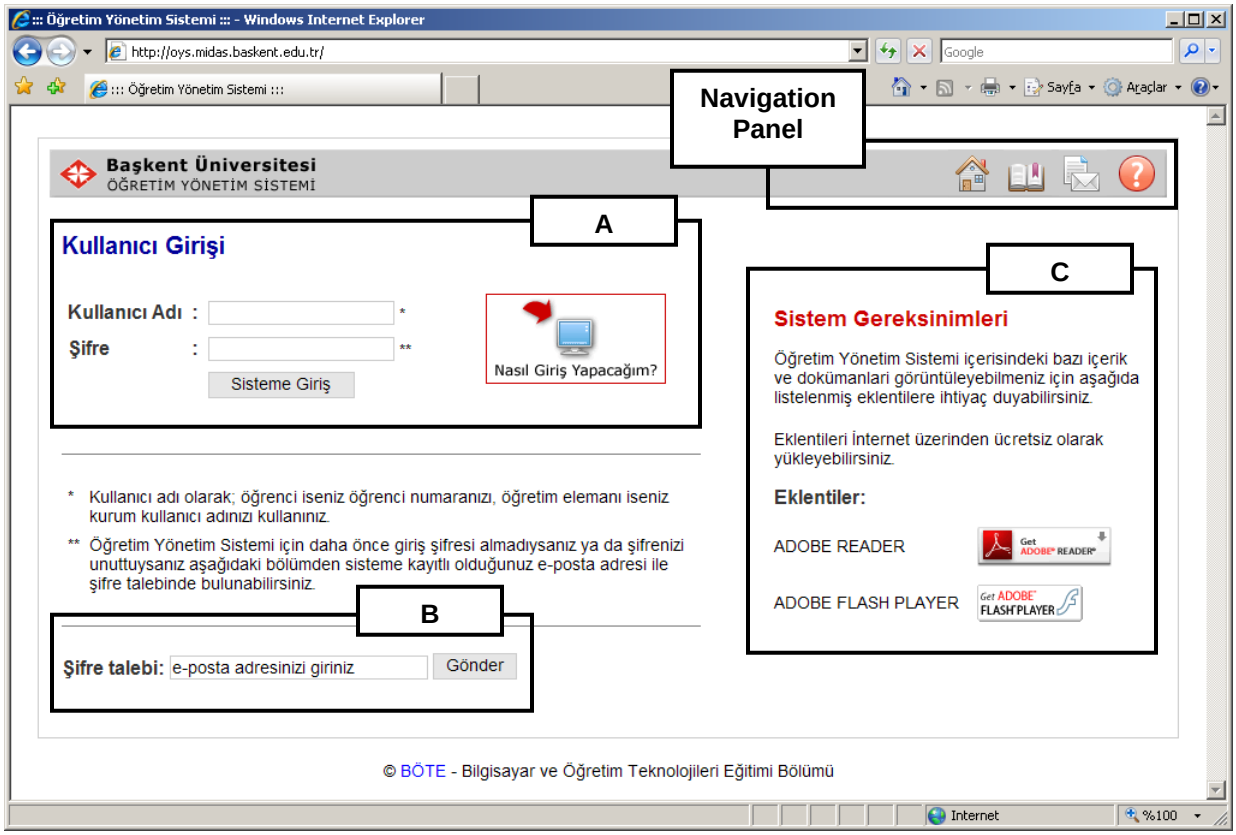

Figure 1. Index page.

The Main Page is a welcome page. This page also contains Mailbox, General Announcements and News, and Announcements and News for Courses sections (Figure 2).

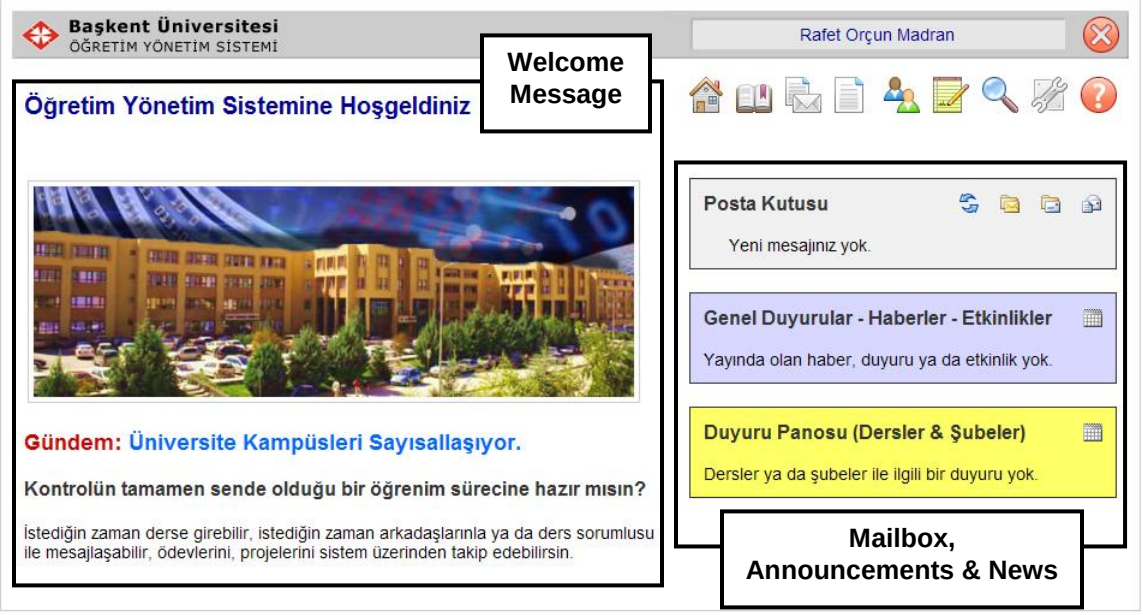

Figure 2. Main page.

The LCMS has a basic template page which contains the major navigation panel (Figure 3). This navigational panel stores these links in the following order: Main Page, Courses, Messages, Forums, Chats, Notepad, Search, Administration, and Help.

Figure 3. Major navigation panel.

The Courses page has a list of courses which are offered by instructors and registered for by learners during their semester (Figure 4).

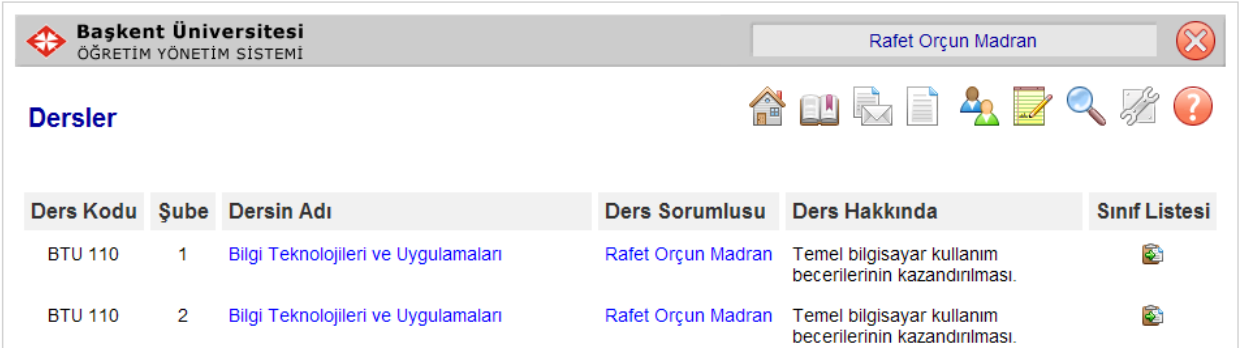

Figure 4. Courses page.

The Course page is a home page for each course. The detailed course syllabus is accessed from the course page. All learning activities and instructional materials are linked from this page. Drill and practice materials are also linked from here (Figure 5).

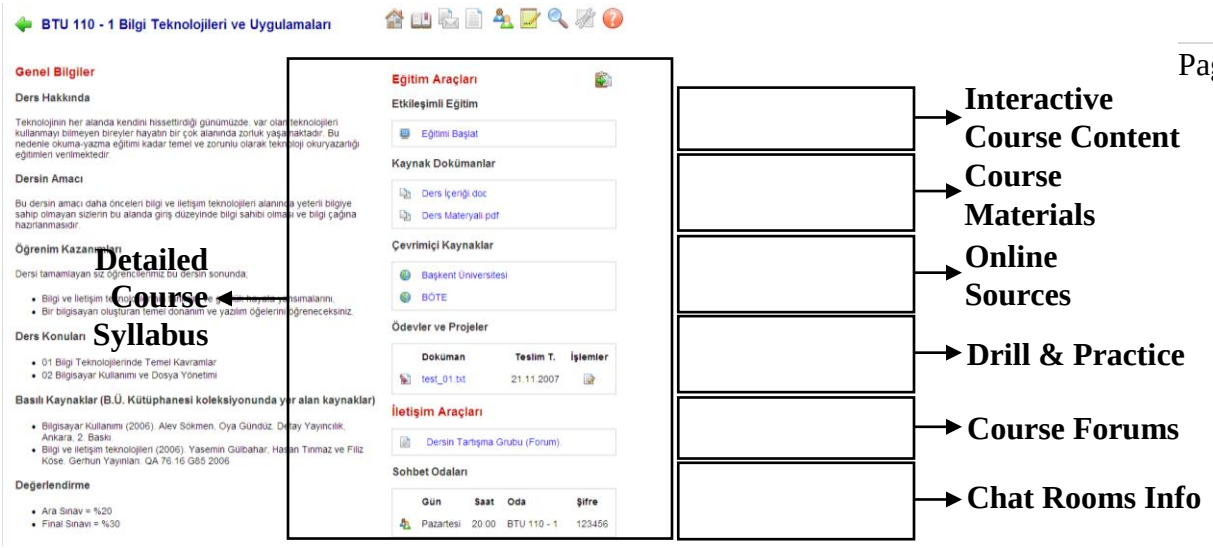

Figure 5. Course home page.

Learners can send their work via the LCMS. Also, they have the chance to reload their work before deadlines. After the deadline, learners can see only instructors' feedback and grades for their work. On the other hand, instructors can manage submitted works, such as deleting, marking, or giving feedback (Figure 6 and 7).

Figure 6. Submitted learners' works.

Figure 7. Feedback and marks section.