

IMPROVING INTERACTION THROUGH BLOGS IN A CONSTRUCTIVIST LEARNING ENVIRONMENT

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ABSTRACT

The current study investigated the ways to improve the interaction through blogs in an information technology course, in which a constructive approach was employed. Eighteen students enrolled in the Department of Computer Education and Instructional Technologies at Anadolu University during the spring semester of the academic year 2006-2007 participated in the action research designed in accordance with the purpose of the study. The data were collected through different techniques and tools including observation and interviews.

Content analysis and descriptive analysis were conducted to analyze data. To sustain credibility, conformability, consistency, and transferability, several strategies were adopted such as in-depth data collection and data triangulation. Findings revealed that the course, which was planned according to constructivist principles and applied through blogs, could improve both instruction and social interaction. Findings also suggested that participants' needs regarding information sharing, instructional support and communication played an important role to improve interaction among participants and with the course instructor. Furthermore, it was observed that blogs could be used as tools to develop interaction in discussions and group works.

Keywords: Weblog; blog; constructivism; interaction

INTRODUCTION

Interaction is defined as the exchange of information and thoughts between students and teachers in order to facilitate learning during technology use (UNESCO, 2007). It is also defined as feedback that mutually occurs between technology and the learner (Gilbert & Moore, 1998; cited in Driscoll & Carliner, 2005).

Interaction is one of the key components that influence success in technology-supported and student-centered educational environments. Interaction in the learning process provides students with opportunities to support active learning, to increase the quality and standards of learning experiences, and to develop high level knowledge and skills (Woo & Reeves, 2007).

Different classifications of the concept of interaction exist in different sources. Moore (1989) mentions three types of interaction as: student-student, student-teacher, and student-content. According to Moallem (2003), interaction in a computer environment falls into two groups on the basis of interaction with content: social or interpersonal interaction and cognitive or individual interaction. From a different point of view, Jung et al. (2002) states three types of interaction in Web-based asynchronous learning environments and classifies them as:

1. **Content-centered academic interaction:** This type of interaction is similar to the three types of interaction stated by Moore (1989). It refers to the interactions of students with each other, with the teacher, with the environment, and with the content.
2. **Collaborative interaction between students:** This is a type of interaction that occurs between students. It involves both instruction-based interaction and cooperation-based group works.
3. **Social interaction:** This type occurs between students and the teacher and among the students themselves. The scope of this type does not cover interaction with the content but includes social interactions that occur on the basis of extracurricular subjects.

Constructivist Learning and Interaction

According to the constructivist learning approach established on the basis of interpretive world perspective, individuals are not passive receivers of the information in the outside world but active creators of information thanks to their cognitive processes, past experiences, and the social environment. Constructivism refers to a student-centered approach that does not feature teaching but learning in contrast with learning theories that bring behavioral changes into prominence. The constructivist learning approach puts forward that individuals establish their life experiences mentally through cognitive processes (Young & Collin, 2004). According to this view, different from socio-cultural perspective, cognitive development is closely related to social context and can not thus be considered separately (Matusov & Hayes, 2000). According to the constructivist view, this relationship between cognitive development and social context puts forward the interaction between the individual and others. In constructivist learning environments, the students are in mutual interaction with the teacher and other students, and they construct information as a result of this interaction. There are different explanations about the constructivist learning approach in literature involving similar basic principles.

Cognitive constructivism was shaped with the help of research conducted by Piaget in the fields of developmental psychology and genetic epistemology trying to explain how information is formed (Smith, 2000).

Vygotsky claims that social constructivism and individual cognition occur in social contexts which have more knowledgeable peers and adults who structure information together and generally transfer this information via a language (Yurdakul, 2005).

Glaserfeld (1982), taking Piaget's explanation about constructivism into consideration regarding radical constructivism, focus on the concepts of coordination and mutual interaction. The structure of the organization is very important for forming information, while for mutual interaction, the focus is on the cognitive structure as well as on the biological structure of the organization. According to interactive constructivism, education is a process of cultural structuring. According to this approach, reality is structured by the observers and participants together. Cognitive constructivism does not deny the importance of social interaction though it focuses mostly on inner processes in learning.

According to cognitive constructivism, high-level symbolization and mutual development seem to be possible for the individual without cooperation with peers (Matusov & Hayes, 2000). Another basic principle of social constructivism is the social interaction based on cooperation in contrast with individual discovery in cognitive constructivism (Applefield, Huber, Moallem, 2000).

The individual forms information again via his or her own cognitive processes, yet for this, the individual needs the social environment –s/he lives in – and a language to interact with this environment. In social constructivism, the low-level psychological functions of an individual are taken into consideration within biological development, while high-level psychological functions are found in socio-cultural development. The individual, for that purpose, use the cultural signs and tools adopted by the society (Matusov & Hayes, 2000).

In educational environments in which the constructivist learning approach is applied, technology is an important aid for both students and teachers. In this learning approach, the role of technology is to support new learning and thus to provide tools that contribute to the cognitive and meta-cognitive processes (Nanjappa & Grant, 2003).

In constructivist learning environments, technology provides students with tools that they can use to form information as appropriate to their own mental processes, to share this information, and to cooperate and interact with their peers and teachers constantly. Technology help students become:

- skilled information technology users,
- information seekers, analysts and evaluators,
- problem solvers and decision takers,
- creative and active users of productivity tools,
- communicative, cooperative, and productive individuals, and
- responsible and participatory citizens (Lowther, Jones & Plants, 2000).

Blogs and Interaction

Web-based learning can be defined as a way of learning, which enables students to regularly participate in courses in class environment through employing the Web to support in-class activities and tasks including group work tasks and discussions (Davidson-Shivers & Rasmussen, 2006).

Blog, also called weblog, is an Internet-based tool which is used to develop and enrich particularly in-class interaction in Web-based learning environments. Blog has been brought into the agenda within the scope of the Web 2.0 technology, which has an interactive structure.

Glogoff (2003) define blogs as frequently-updated personal online diaries. Baggetun and Wasson (2006) define blogs as personal or group diaries accessible by everyone. With its most general definition, blogs enable users to create Web pages without having any knowledge of how to design it; in addition, blogs enable users to write about various subjects on these Web pages and enable other users to add comments to the written messages (Çuhadar & Kuzu, 2006). For any Web user, blogs are not different from Web pages, but blog software creates an interactive Web site, which constitutes a part of statements about a certain subject and which can easily be updated (Martindale & Wiley, 2004).

Since blogs provides students with an environment that helps students reflect and publish their own thoughts, it could be stated that blogs are very effective tools in teaching and learning (Ferdig & Trammell, 2004). Blogs, which are Web-based tools, are also used for the purpose of enriching face-to-face education carried out in class environment. Blog pages supplemented by multimedia elements become a virtual environment in which the course content is presented to students with the help of hyperlinks provided for access to a countless number of sources of information on the Internet. Moreover, blogs can be integrated into cooperative learning environments in which students work to achieve a learning goal (Wang & Fang, 2005). Thanks to their interactive structures, blogs allow cooperative working in educational environments in which the constructivist learning approach is applied.

Blogs, with their structures that support asynchronous interaction, also make it possible to continue in-class activities and related discussions out of the school. As also emphasized by social constructivism, social interaction and active participation in the process is very important for individuals to understand and acquire information. However, students may not sometimes participate in discussions and activities carried out in class due to several reasons. In some studies conducted on in-class discussions, it was found that students found such discussions sufficient, and preferred electronic environment for the discussions and questions they directed (Gülbahar, 2005). Akar and Yıldırım (2004) reported that students, comparing their own experiences with the experiences of their peers and theoretical information through dialogues and interactions, formed new information and criticized their knowledge and experiences.

Current educational research and theories underline the importance of social interaction in teaching and learning (Ferdig & Trammell, 2004). The constructivist learning approach emphasizes the significance of social environment and interaction for forming information.

According to the approach, social environment plays an important role in cognitive development (Vygotsky, 1978); and it is claimed that social interaction is one of the factors that influence mental development (Charles, 2003; Piaget, 1973). One of the most significant contributions of blogs to social interaction is the fact that blogs serve as a catalyzer on the basis of acquaintance and social cohesion among individuals.

Students sharing the same environment during the learning processes can become acquainted with each other with the help of blogs and can strengthen their relationships by sharing their feelings and thoughts with each other out of the class environment.

Related Studies

Use of blogs for educational purposes has recently taken its place in the literature as a new subject that interests researchers from all over the world. These studies generally try to support in-class education with Web and enrich the interactions among the students as well as between the students and their teachers.

The Dickey (2004) study is one of such studies. Participants of the case study, which basically aimed at determining the influence of the use of blogs in a Web-based environment, were teacher candidates who would teach in different schools at different educational levels. According to the findings of the, in which blogs were used for discussion purposes in online courses, blogs cleared away undesired feelings of students including isolation and alienation in distance-learning environments. In addition, the students, who compared the learning management system software called Blackboard with blogs, reported that blogs were much easier and faster to use as a tool.

Armstrong, Berry and Lamshed (2004) focused on the use of blogs as a diary to document student learning. For this purpose, the researchers created a blog that students would use as a diary of learning, and told students how to use this blog. After the students used the blog for a certain period of time, semi-structured interviews were conducted with 11 students to determine their experiences related to the use of the blog. The findings revealed that the students generally had positive views about the use of the blog. As one of the students reported, blogs could be used like a notebook in which they could write down and keep their thoughts. It was also reported that blogs could present the written texts in a chronological order and thus help organize the information. According to the students, another important benefit of such chronological presentation was that they were able to follow their own learning processes.

Hernández-Ramos (2004) conducted a study within the scope of a course of instructional technologies found in a teacher training program, and compared online discussion forums and blogs as tools that support reflective applications. Each of the 56 students participating in the course within the scope of the study was asked to create a blog on the site that provides costless blog service and then to inform the faculty member about the Web link of the blog via e-mail.

Moreover, the students were expected to participate in the discussions in forums. The forum and blog registrations of the students were used as a source of data by the researchers. The results of the study revealed that 53 of all students could create a blog without any support. It was observed that the students went on using the forum even after the end of the course. It was also found that even though the scope of the blog was generally made up of the subject determined by the researcher and of the related experiences of the students, the views and subjects found in the blogs varied. In addition, the research results indicated that blogs and discussion forums were important tools that helped teachers get acquainted with their students. Furthermore, it was reported that when students' blog use and their participation in forum discussions were evaluated with a scoring key, these tools supported reflective writing.

Xie and Sharma (2005) conducted interviews with nine doctorate students to determine their views about the use of weblogs in class environment. The findings obtained were thematized by the researchers as positive and negative views.

When the positive themes were examined, it was found that blogs were helpful tools for learning and thinking, they gave the feeling of community to the students, and they provided the students with the opportunity to discover a new technology. The result that the students who had not used blogs before were not sure of themselves about the correct use of blogs was considered to be a negative result. In addition, since blogs are Web-based tools, the fact that other individuals out of class environment were able to access to the messages and texts written on blogs demonstrated that the students experienced privacy-related problems.

Williams and Jacobs (2004) conducted a study on the use of blogs as a learning environment in higher education, and stated that blogs could be a transformational technology in education. Regarding the blogs they applied in the scope of two courses, the researchers collected the research data with the help of a questionnaire from a total of 102 voluntary students who participated in the study and attended the courses. The findings obtained revealed the positive and negative views of the students about the use of blogs. When the students who did not participate in the blog were asked about the reasons for this situation, 66 percent of the students reported that they did not find the blog worth participating in or that they were not sure whether it would be beneficial for them. On the other hand, 66 percent of the students participating in the study believed that they considered blogs as a facilitating environment for learning. Besides, 77 percent of the students found the blog positive in terms of interaction and 57 percent of them wanted to consider the blog as a tool for learning.

In another study conducted to determine the benefits of weblogs in cooperation-based learning, Wang and Fang (2005) administered a 20-item questionnaire to 55 students. One of the findings obtained in the study was that use of blogs increased the confidence of students in learning. The students who reported that their social skills and the effectiveness of team work increased stated that they were pleased with the use of blogs for communication purposes as a new technology. Among all the students, 93 percent emphasized that they were happy to learn the use of blogs as a new communication tool. Moreover, 91 percent of the students believed that face-to-face interaction would help them achieve the learning goals.

In addition to aforementioned studies, there are post-graduate works on the educational use of blogs. One of these studies was a doctorate study conducted by Perschbach (2006) to determine the effectiveness of blogs as a Web-based technology. In the study that aimed at determining the evidences regarding critical thinking and reflection in student blogs, qualitative and quantitative research methods were applied together. The research findings indicated that almost all of the participating students acquired critical thinking skills with the help of blog use and most of the students interacted via the blog in the course. Shoffner (2006) conducted a study to investigate the use of blogs for reflecting the views of teacher candidates. The blog was used in the study as an environment for teacher candidates to reflect their views in their preservice training.

As a result of the content analysis of the data obtained through the interviews held individually and in groups, it was revealed that the blogs had a positive potential to reflect the views of the teacher candidates. In the study, the accessibility to the blogs via the Internet and their structure that supported interaction between individuals were regarded as factors that formed this positive potential.

In another doctoral thesis study, Tan (2006) investigated the effects of online and face-to-face support on the reflection levels of preservice teachers. The researcher carried out a quasi-experimental study with 48 teacher candidates and faculty members. Qualitative and quantitative data collection techniques were used in the study. According to the findings, there was a significant difference between enriched support and high-level reflection. Another finding revealed no significant difference between the reflection with the help of the online tool used and high-level reflection. The researcher claimed that this situation might have resulted from the individual differences of the teacher candidates and from their levels of understanding the online tools. Even though the online tools were statistically found not to support reflection, the researcher, depending on some findings, asserted that blog use and enriched support improved reflection.

Purpose

The purpose of the current study was to determine how interaction could be achieved in a blog-supported way in the course of "Information Technologies in Education II" organized on the basis of constructivist learning theory. In line with this overall purpose, the following research questions were addressed: With the help of blog in the course of "Information Technologies in Education" II organized according to the theory of constructivist learning theory,

1. How can student-student interaction be developed?
2. How can student-teacher interaction be developed?
3. How can student-content interaction be developed?
4. How can social interaction be developed?

METHOD

Research Model

This study was carried out as an action research. Mills (2003) defines action research as a systematic data collection process conducted by teachers or by other sharers in the teaching-learning environment to inquire how the school functions, how teachers teach, and how learners can learn better. According to Johnson (2005), the basic purpose of action studies is to develop educational applications and to enrich the functionality of the school. In this respect, action research requires systematic collection of data with the help of techniques such as observation, interview, and document analysis; and necessitates development of the educational application in line with the findings revealed by the data obtained.

Participants

The participants of the present study were 18 freshman students attending the Department of Computer Education and Instructional Technologies at Anadolu University in the Spring Term of the academic year of 2006-2007. Participants were determined through the purposeful sampling method. Purposeful sampling, also known as criterion sampling, means studying the situations that meet the criteria previously determined in the study (Yıldırım & Şimşek, 2005). In purposeful sampling, researchers determine the participants—who have the desired characteristics or qualifications most appropriate to the research goals—as a sample on the basis of their own judgments (Balci, 2004). Among all the students participating in the study, 13 were males and five were females. Of all participants, 15 students were dwelling in houses, and three of them were in dormitories.

While 12 students had internet connection in their dwelling and owned a computer that they were able to use whenever they wanted, six students stated that they did not have such an opportunity. Among all students, 11 students reported that they preferred Internet Cafes to access the Internet. In addition, access to Internet was possible for four students at home, for two students both in Internet Cafes and at school, and for one student only at school. When the frequencies of the participants' access to the Internet were taken into consideration, it was found out that 11 students accessed to the Internet a few times a week. Six students used the Internet once a day and one student a few times a day. Of all participants, 17 students used the Internet to communicate with their classmates or with other students in the department, and seven students accessed the Internet to communicate with their teachers. All students stated that they benefited from the Internet to reach the necessary information or sources related to their courses.

Environment

The study was carried out in a blog-supported way in the scope of the course of "Information Technologies in Education II" (ITE-II) offered in the Department of Computer Education and Instructional Technologies in the Education Faculty of Anadolu University in the Spring Term of 2006-2007. The face-to-face part of the course was executed in the laboratory environment. The goal of the course was to help students acquire the skills in using data bases, designing Web sites, using e-mail accounts, and using the computer in a healthy and ergonomic way.

In order to form the Web-based part of the course, blog software called WordPress was used. WordPress is an open source freeware that is PHP-coded and requires MySQL database support. In order to present the blog environment to the participating students without any problems or interruptions in the service, and to ensure the security of the research data, a service provider that gives professional hosting service presented WordPress to the students. In addition, in order for the students to access the course blog easily, the domain name of <http://www.bto104.info> was used, which was generated according to the course code (i.e. BTÖ104).

Implementation

Yıldırım and Şimşek (2005) state that action research can be conducted by the action researcher himself or herself or by another researcher. During the implementation process, there was cooperation, interaction and sharing among the researcher, the course instructor, the field experts consulted while determining the course activities, and the members of the action research validity committee. The implementation regarding the course process started with the first lesson on Monday, the 19th of February, 2007, and ended with the last lesson of Spring Term on the 29th of May, 2007. The time allotted for the semester covered 14 weeks including the official holidays and exams.

Thus, the implementation phase of the study was carried out during the 10 weeks of the total duration. For the planning of the study and the course period, the researcher cooperated with other researchers and experts in different fields to shape theoretical, methodological and technical aspects of the study. This cooperation was accompanied by a systematic study on the planning, implementation and analysis of the activities carried out each week. The structure that represents the implementation process of the present study can be explained as follows.

Table: 1
Work Cycle of the Research Process

	Weekly Macro-Analysis of the Data							
	Wednesd	Friday	Saturday	Sunday	Monday	Tuesday	Wednesd	Thursday
Meeting for determining the blog activities								
Evaluation of the previous lesson								
Preparations for the execution of the blog activities								
Application of the introductory activities								
Application of the presentational activities								
Execution of the face-to-face course in the Laboratory								
Meeting for the validity committee								
Application of the exercise activities								
Application of the feedback activities								
Application of the evaluation activities								

In the ITE-II course process, the blog pages were prepared as appropriate to the purposes of the study. The blog environment included the links for Homepage, About, Canteen, Frequently Asked Questions, Help, Courses, and Teams. On the blog pages, the part in which interaction occurred for instructional purposes included the weekly activities found under the link of "Courses". During the 10-week blog activities, each activity week under the heading of "Courses" and sub-links related to the activities were formed. In order to reach the blog activities that belong to the related week of the course, the students used these links. The students, who entered the blog environment with the help of the username and password given to them, were able to reach the course activities by clicking the courses link found on homepage and then clicking the sub-link of the related week. The students, who entered the courses link and then the sub-link of the related week, carried out such course activities as discussions, readings and research expected from them. During the blog-supported ITE-II course process, both the face-to-face course executed in the laboratory environment and the weekly course activities structured in the blog environment were made up of such activities as entrance, presentation, exercise, feedback, and evaluation. The weekly activities were determined at the meetings held to identify the activities by the course instructor and by the field-expert researchers.

In order to develop the social interaction among the 18 participating students who took the ITE-II course, a link was formed in the blog environment. This link was named "Canteen" since it was similar to the environment in which the students spent time together between the course hours in the school. Under the canteen link, the topic titles were formed through using the personal information obtained from the students via a form at the beginning of the implementation process, and by making use of the data obtained from the first semi-structured interviews.

The underlying purpose was to create a social environment with the participation of both students and instructors. In addition, the suggestions made by the students during the implementation process were taken into consideration while determining the topic titles.

It was also possible for the students to make suggestions about other subjects besides the topic titles determined by the researcher in line with the data. Moreover, starting from the 8th week of the implementation process, three instructors from the Department of Computer Education and Instructional Technologies were involved in the blog environment to increase interaction in the canteen part.

At the beginning of the implementation process, a validity committee was generated consisting of faculty members who were experts in Web-based learning and in Qualitative research methods. During the 10-week period, weekly meetings were held with the validity committee members, who were consulted for their views - on the basis of theory and method - about the problems experienced during the implementation and about the solution offers for overcoming these problems. The discussions made during the meetings were audio-recorded, and these records were evaluated as a data source. One of the basic functions of the validity committee meetings was to take decisions that would direct the research process.

The decisions were mostly taken by the committee members. In addition, the suggestions made by the researcher and/or by the course instructor were also accepted as decisions if approved by the committee. The decisions taken were saved by the researcher in the "Validity Committee Meeting Decision Book" and were put into practice after the necessary technical and instructional preparations were made by the researcher and by the course instructor.

Data Collection Tools

In order to identify possible problems that were likely to occur in the educational environments during the action research process and in order to provide solutions to these problems, it was necessary to collect and analyze the research data systematically. In addition, the sufficient and thorough description of the environment by the data obtained was an important aspect of the data collection process. The data collection tools and the data sources used during the implementation process were as follows:

1. Validity committee meeting records
2. Personal information form
3. Video records evaluation form
4. Blog activities evaluation form
5. Researcher diary
6. Semi-structured interviews
7. Video records for observation purposes
8. Blog records and statistics
9. Student reflections regarding the blog application
10. Blog moderator reports
11. Team work evaluation form
12. Mid-term exams and final exam

Data Analysis

The analysis of the research data was carried out in two phases: the analyses conducted in the research process and the analyses conducted at the end of the research. Descriptive analyses were run at macro level during the research process, and descriptive analysis as well as content analysis techniques were run at the end of the research.

Descriptive analysis is usually applied when the theoretical frame is clear. The researcher can form the thematic structure – which will be necessary for the analyses of the data - on the basis of the research questions (Yıldırım & Şimşek, 2005). Content analysis is applied when the research can not be clearly expressed theoretically or when there is a need for a more in-depth analysis.

Validity and Reliability of the Data

In qualitative research methods, concepts of credibility, transferability, dependability and confirmability are on stage to express the validity and reliability (Guba, 1981: cited in Shenton, 2004). In this study, certain strategies were applied to ensure validity and reliability. These were:

- Long interactions with the participants in face-to-face courses and in the blog environment,
- Collecting in-depth and interaction-focused data in line with the research goals,
- Triangulation of the data by collecting different types of data with the help of different data collection tools,
- Approval of the research findings based on the views of the participants and of the implementing instructor,
- Use of purposeful sampling to determine the participants,
- Detailed description of the data via descriptive and content analyses, and
- Being as much impartial as possible for the collection and analysis of the data.

FINDINGS

General Findings Regarding the Implementation Process

From the beginning of the implementation process to the following weeks of the academic term, an increase was observed not only in participation in the blog activities but also in the number of the written messages.

It was also observed at the beginning of the implementation process that some students were not able to participate in the blog activities for various reasons in certain weeks and that some students never participated in the blog activities.

The reasons for not participating in the blog activities were discussed at the validity committee meetings in line with the data obtained with the help of student reflections, interviews and of other data collection tools.

The actions taken in line with the decisions taken at the validity committee meetings during the course process were as follows.

A. Decisions Taken in the 1st Week and Action Plans

1. Students will give the Web link in their blog activities not by copying-pasting the information they obtained via the Internet but by giving a brief summary of the information.
2. The blog activities will be carried out by the course instructor.
3. Students will be asked for their reflective views about blog use.
4. In order to increase the students' motivation regarding the blog entrance, a list of "the best of the week" on the blog homepage will be provided.

5. The blog activities will be carried on by a different moderator to be appointed among students each week.
6. The two-click entrance to the canteen will be decreased to one-click.

B- Decisions Taken in the 2nd Week and Action Plans

1. For the planning of the activities, a team including the researcher, the instructor and three experts will be established.
2. Blog activities will be used for performance evaluation in the process of the course executed in line with the constructivist approach.
3. Documents with different contents will be provided on weekly basis for the blog activities.
4. The blog interface will be made more interesting.
5. The course instructor will organize various activities to help students - who do not know each other well in the class – get acquainted better with each other.
6. The appropriateness of the activities will be double checked before their publication in the blog.

C- Decisions Taken in the 3rd Week and Action Plans

1. The feedback and evaluation activities in video analyses will be integrated into the analysis process.
2. The blog activities will be spread to the whole week instead of execution on certain days.
3. The blog activities will be announced to the students via short messages on mobile phones.

D- Decisions Taken in the 4th Week and Action Plans

1. A guest instructor will be invited on weekly basis to the blog in order to increase participation.
2. In order to increase participation of the students who experience problems accessing to the Internet, the computer laboratory will be kept open in the evenings.
3. In order to determine the students who enter the blog yet do not make any comments, the codes necessary for the blog software will be organized.
4. The students who have been reluctant to participate in the blog for a long time will be interviewed, and by determining the reasons why they do not participate in the blog, the necessary precautions will be taken.

E- Decisions Taken in the 5th Week and Action Plans

1. No decisions have been taken. The present actions will be applied.

F- Decisions Taken in the 6th Week and Action Plans

1. While publishing the documents with different content types in the blog environment, each document will be labeled in a way to show which content type it belongs to (The decision – number 3 – taken in the second week has been revised)

G- Decisions Taken in the 7th, 8th, 9th and 10th weeks

1. No decisions have been taken. The present actions will be applied.

The decisions taken as appropriate to the action research process were put into practice, and the factors that prevented the students from participating in the blog were eliminated.

As a result, an increase was observed in the level of participation in the blog activities and thus in the level of interaction in the blog and class environment.

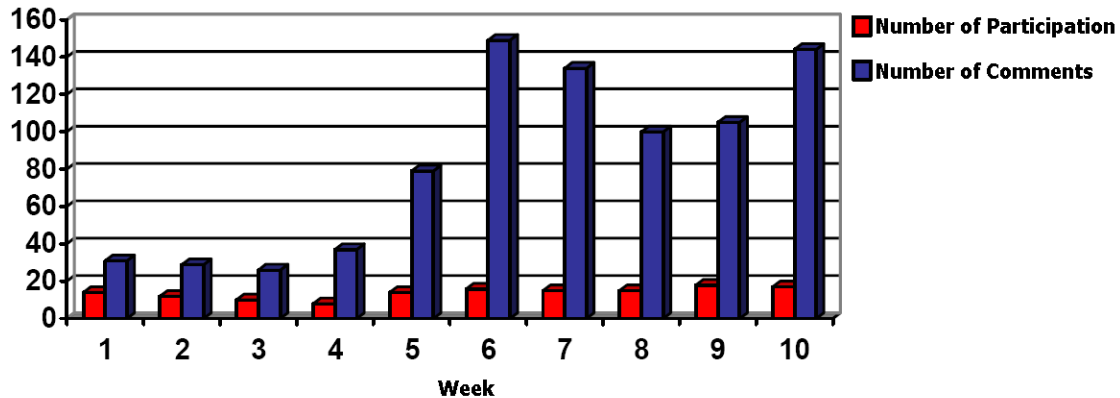


Figure: 1

The number of comments and participation in the blog activities in each week

Seven of 18 participants stated that they did not have any expectations regarding the blog-supported course at the beginning of the academic term. The main reason for this was claimed to be the fact that the students did not know what a blog was. The students who learnt the basic features of the blog and for what purposes the blog could be used in the courses had positive expectations regarding the blog-supported course consequently. In line with their previous experiences and with their personal estimations, the students put forward their expectations - regarding a blog-supported course- in the dimensions of support to instruction, interaction and of learning the blog better.

The students who regarded the blog as an opportunity to be more interested in the course believed that the face-to-face course would be more productive with the blog activities. The students also had an expectation that the assignments in the course activities and other applications would be carried out via the blog. In addition, the students reported that they were curious about how the blog would contribute to the course and that they expected to acquire the skills to use and learn the blog. It was also reported that at the beginning of the implementation process, there was an expectation for a conversation-like course which allowed exchange of information and in which everybody could freely express their thoughts regarding the student-student interaction dimension of the blog-supported course.

In addition, it was stated by the students that they wanted to be in constant communication with their classmates via the blog. The students also stated that they could interact with the instructor more and that this interaction would contribute to their learning. Another expectation was that in the blog-supported course, there might be an environment in which written and visual information could be shared and in this way, the course content would be learnt better.

"Now, because at the beginning of the term, nothing like a blog like this was applied before, I was not expecting a good thing at all. That is, to tell the truth, I did not expect it would be beneficial for us." [AQ]

"It was good. Well, it was good because it increased our participation in the course. That is, it helped us become more interested in the course. Well, how could I explain it? Well, now, the more interested we are in a course or in a subject, the more information we will take. We learn more things." [HÚ]

Findings Regarding the Development of Student-Student Interaction

According to the findings obtained from the semi-structured interviews, the students emphasized that the blog contributed particularly to the development of the social interaction among them during the course. It was also revealed that the blog allowed the students to communicate with their classmates not only during the course hours but also for the whole week and that the blog also increased sincerity of the students. Some of the students reported that they were in more interaction with their classmates in the blog environment than they were with their other friends in other courses, and that they were more intimate with their current classmates than they had been before. The students, who stated that they had the opportunity to know their friends better with the help of team works and other course activities, stated that they were able to share their thoughts about their interests in the canteen section of the blog.

In the semi-structured interviews held at the end of the academic term, several themes were obtained regarding the blog-supported course process. One of these themes was "Information sharing", which was formed for the interaction among the students. It was stated that the thoughts could be discussed by the classmates and that these discussions increased the interaction which was not at a sufficient level at the beginning of the academic term. In addition, among the situations found positive in terms of interaction was the fact that the classmates who were knowledgeable could answer the questions directed during the discussions and that there occurred different points of view. The students reported that they made friends with the classmates whom they had not known before. The students stating that they had the opportunity to know their friends without face-to-face communication emphasized that they established a dialogue with the students whom they were not keeping in touch with at the beginning of the academic term. The students also pointed out that with the help of the blog they got introduced to the students who had just come from other universities through undergraduate transfer. In the blog-supported course process, besides the positive views reported about student-student interaction, there were also several negative views. It was indicated that the interaction among the students did not occur at a sufficient level and there was an expectation for a higher-level interaction among the students. Another negative view, which could also be regarded as a suggestion, was that when one knew who was online in the blog environment, a higher-level of student-student interaction would be likely to occur.

"At the beginning, well, our relationship was not so good. It was not good. This blog, well, after it was opened, we discussed the questions whose answers we didn't know. Well, that's, we knew each other better. We were eager... err...interaction occurred." [AM]

"At first, we didn't talk to each other so frequently..., well I didn't know most characteristics of my friends. But with the blog, I knew more about them. Well, now, I'm closer to my friends. For example, I...I didn't use to smile, but now I'm better." [NK]

There were other views – thematized as “Learning from peers” - about the effects of interactions with friends on their learning and on their academic achievement in the blog supported course. The students stated that they constantly exchanged information with their classmates in the blog environment; they directed the problematic questions to each other and received answers to these questions; and in this way, their interaction with one another increased.

The students reporting that the comments made by their friends during the blog activities led to curiosity about the subjects stated that this curiosity caused them to conduct research. The students who did not participate in the face-to-face course in the laboratory environment for various reasons tried to overcome their shortcomings by directing questions to their friends in the blog environment. It was also reported that the students sometimes directed questions to each other and received answers in face-to-face courses besides the blog environment increasing the interaction among them.

“Our interaction with friends... for example, I asked questions to them when I had a problem, and they asked me too. Well, our interaction increased. And, in this way, we overcame our shortcomings. It influenced our success positively.” [CD]

Another issue mentioned regarding student-student interaction was the contribution of the blog to learning. One student reported that his success increased when he started participating actively in the blog activities towards the end of the academic term. Another student stated that their interaction levels increased when they learnt that the blog was a beneficial application for their courses.

The students also reported that the blog activities helped them mentally prepare for the course, and contributed to the reinforcement of their knowledge to follow the courses. Another positive reflection among the students was that it helped decrease the stress levels of the students regarding participation in the class environment. The students pointed out that the blog activities and their increasingly positive relationships helped them be more comfortable in the courses.

The increasing interaction also enabled the students to predict each other’s reactions, and to feel relaxed in the class environment. The students stating that the courses were more amusing due to interaction with their friends emphasized that thanks to this interaction, they became more active in the courses. In addition, the students reported in their responses that they established closer relationships with their team-mates. Team works led to increase in their learning levels and in their responsibility-taking for learning.

“It influenced my success because, well it’s like that. For example, even though I wasn’t interested in the lesson, my friends asked me questions. Then, I wanted to interact with them at least to answer their questions.”
[FE]

“...at the time we started the blog, we didn’t know what it was. And we didn’t like it at all. We didn’t enter, and the course, we didn’t look at the course contents. But, later, well, when we understood that the blog was good and beneficial for our courses, our interaction increased.” [CD]

During the interview, the students put forward some suggestions regarding the development of the interaction among the students in a blog-supported course. The first suggestion was to increase the team work. The students stated that longer time should be allotted for team work in such a course, and the team work should start in earlier weeks in the academic term. It was also suggested that extracurricular activities be carried out more frequently, and participation in these activities be increased.

Another suggestion put forward by the students regarding increasing participation in the blog was that they should be made more familiarized with the blog at the beginning of the implementation and should be informed more about the features of the blog.

In addition, the students stated that execution of the blog activities by two or more moderators rather than by one would increase participation and interaction, and the moderators chosen should guide their friends by researching the subjects to be taught that week.

The last suggestion regarding the development of student-student interaction in the blog activities was that the intensity of the weekly course activities be decreased or organized according to the course-loads of the students.

"Well, if there is a blog-supported course, interaction with the students could be increased by focusing on other social activities, well, different topics, not just the course." [AA]

"Something like, for example, moderator. Not just one person, two or three people become moderators. For example, they will be responsible for only the parts that our teacher responds to. This... for example, our friends learn... well, they can direct the topics." [FT]

It was observed that some of the students were reluctant to interact with the other students in the class and to participate in the blog activities. The students explained some of the reasons for this reluctance stating that they had constant connection to the Internet, that they regarded the blog as an artificial environment, and that there was little participation. This situation was discussed at the validity committee meetings, and various precautions were taken to overcome such problems. One of these precautions was to hold an interview with these students.

"... I asked them for their thoughts about the blog. They told me that in fact, everything was all good and that the problem arose from their own. I asked them what it was, and they each time replied to me evasively and said that it just somehow didn't work. But,... they entered once or twice before. When I told them this, ... the student said "I asked a question to the teacher on the blog, and the teacher told me to ask my friends first" and the student told me that this attitude of the teacher made him alienate from the blog. In fact, the student said that he entered the blog and just read the messages without writing any comments. ... kept silent or ... just approved what was said. After 15 minutes of interview, I told them that I would be happy to see them on the blog and we left." (Researcher diary, 13.04.2007)

With the development of the interaction between the teacher and the students in the following weeks of the implementation, the students had more positive attitudes toward the blog application. With the development and application of the action plans particularly in the fifth and the sixth weeks, an increase was observed in the level of interaction among the students and in student participation in the blog activities.

Findings Regarding the Development of Student-Teacher Interaction

The most-stated views about the interaction between themselves and the teacher were found to be "Information Sharing". The question-and-answer activities were very important for the interaction between the students and the instructor.

The students reported that they asked questions to the instructor about the subjects they did not know, and the instructor replied to them as soon as possible. Some of the students also stated that they were more active in their interaction with the instructor in the blog environment.

In addition, the positive attitudes of the instructor to the students were emphasized. The students mentioned that the instructor behaved them sincerely and helped them a lot. It was also pointed out by the students that the level of interaction between them and the ITE-II course instructor in the laboratory environment, and during the blog activities was higher than the level of interaction between them and the instructors of other courses. In addition, it was reported by the students that interaction with the instructor increased gradually from the beginning of the academic term to the end, the low level of interaction at the beginning increased thanks to the blog, and the blog helped the students become closer to the instructor more quickly.

It was seen that the instructor's way of teaching the course was a predictor of the interaction between the instructor and the students. The efforts shown at the end of the presentation of the lessons by the instructor and the clear feedback the instructor gave to the students when necessary were considered to be positive in terms of the student-teacher interaction. It was stated that particularly the applied courses were more amusing than the theory-based courses and interaction with the instructor in such applied courses increased. Moreover, out-of-class social activities carried out with the instructor during the academic term, though in limited numbers, had positive impact on the increase in interaction.

Besides the positive views stated about the student-teacher interaction, the students also reported their negative views. Initially, the students, pointing out the theory-based courses taught in the first weeks of the academic term, stated that these courses were boring for them and this situation negatively influenced their interaction with the instructor. Though mentioned in the previous questions once before, the fact that one was not able to know whether the instructor read the messages written in the blog was restated as a response to the related question again.

This situation was reported with the statement of "we felt as if what we wrote in the blog would not be replied to". The students also reported that the instructor was sometimes not able to respond to their questions probably because the instructor was also very busy with other courses. Furthermore, according to the blog records and related data, the students were more active in the weeks when the instructor participated more actively in the blog.

"Well, it was good. Generally, the instructor answered all our questions. In fact, our teacher possibly got tired towards the end of the term. Thus, the instructor couldn't respond to the questions. ..." [SÜG]

"To tell the truththat's, well, my best teacher, now ...was the course teacher. That's, the course I attended... because he was the teacher whom I had the most interaction with. All the time, he helped us. Well, I can say that. I was pleased with him. "[HÇ]

During the course process, the students stated various views about the effect of their interaction with the instructor on their success in the course and on their learning. As indicated by most of the research findings, information sharing with the instructor came into prominence for the responses to this question as well.

According to the views of the students, feeling free to ask questions to the instructor and receiving responses to these questions led to increase in the success levels of the students. In addition, it was emphasized that quickly receiving responses to the questions directed to the instructor influenced students' success. Another point mentioned was that the student-teacher interaction affected students' success, expressed with the theme of "Participation in the Course". According to them, the fact that they were constantly in interaction with the instructor increased their interest in the course and caused them to enjoy the course. The efforts shown by the instructor to make the students comfortable in the course during the execution of the course caused the students to give more value the course. The students also reported that as they saw the blog activities contributed to their learning, they felt obliged to participate in the activities.

Another theme related to the contribution of student-teacher interaction to success and learning was "Contribution to Learning". The students reported that their being prepared for the courses increased their interaction with the instructor. If they had interacted with the instructor only in the lessons, then they wouldn't have learnt so well. They also stated that the instructor helped them develop themselves with the help of assignments and research, and the instructor encouraged them to think more about course-related subjects.

"The person who loves the teacher also loves the course. This is a common student thought. In this respect, if we think logically, we really enjoyed the course. We liked both the content and the efforts that our teacher showed to teach us. And we were obliged to enter the blog. Why was it compulsory? This obligation was not due to the teachers. When we entered the blog, it really had positive effects that week. That's, when we entered the blog, we learnt the lesson better." [MEÖ]

"Well, err, if had met our instructor, our teachers, only from lesson to lesson, ...err, may be, the lessons wouldn't have been pleasing, and we would have got bored. And we wouldn't have learnt so many things. Well, because we were in constant interactionbecause we were in good relationships with our teachers, we entered the courses with relish. We were more enthusiastic about the course. This facilitated our learning"[RO]

One of the suggestions regarding student-teacher interaction was that more importance be given to social activities which the instructor and the students could participate together, and that the instructor participate more in the canteen part. Some students stated that they self-criticized themselves regarding the implementation process and that the students should have shown more efforts to interact with the instructor.

Some students stating that the duration of the course was not sufficient emphasized that interaction with the instructor could also be achieved by increasing the duration of the course. It was also suggested that the number of guest instructors be increased and that guest instructors come and teach on weekly basis starting from the earlier weeks of the academic term.

"Well, other instructors as guests sometimes came and taught us... It would have been better for example if they had come every week. Of course, this was partly because the blog was one-year oldcertainly, I believe in the following years, it will be better. If the number of guest instructors is increased, I'm sure it will be more beneficial." [IT]

Findings Regarding the Development of Student-Content Interaction

One of the general views of the students about the presentation of the course content in the blog environment was that the presentation of the content in the blog environment helped the students prepare themselves for the lessons. The students stated that when they were prepared for the lesson with the help of the blog activities, they better-understood and better-learnt what the instructor taught them. One of the students reported that he had difficulties in learning the course subjects in the weeks he did not participate in the blog activities.

"The blog was useful for the lessons because it helped us prepare for the course. Also, I did not participate in the presentation activities for one or two weeks. Well, in fact, I took the activities, but I did not carry out them. I only make a comment and left, so I had difficulty in the lesson." [MEÖ]

The presentation of content in the blog environment was beneficial since it helped the students revise the lessons, and reinforced learning following the face-to-face courses. Students stated that by reaching the course content presented in the blog environment and by participating in the activities, they compensated the lessons that they were unable to attend. The students also reported that the blog environment provided a discussion environment on the basis of the course content. Thus, they learnt the subjects better as they participated more. In addition, the students mentioned that with the help of the blog environment, they accessed the responses to the questions regarding the course content. The instructor structured and presented the course content in a way that students could easily understand. Before the presentation of the content, the instructor encouraged the students to research the course subjects through documents and additional sources. This approach of the instructor was considered beneficial by the students. The students pointed out that the instructor facilitated their learning in the blog environment with the help of pure and well-organized sources that did not include any unnecessary information. On the other hand, there were negative views reported by the students about the presentation of the course content. Some of the students stated that the blog application required them to study more.

The students finding the duration of the course inadequate for the presentation of the content pointed out that the sources provided could have been organized better. Furthermore, the students reported that it was difficult to read long documents on the computer:

"Yes, it helped us prepare for the course. In this way, we were able to understand the lesson better. It was beneficial." [AK]

"That's, well, it helped me follow the lessons that I didn't attend. Also, it helped me revise the lessons before the exams. Well, to me, this is something much better than studying a lesson from a book." [SO]

Materials with different content and of different types of environment were presented to the students in the blog environment. Some of the students stated that there was no effect of the content types on interaction with the content. These students believed that all of the sources provided by the instructor would be beneficial for their learning. On the other hand, there were some contradictory responses as well. For instance, one of the students once stated that he did not discriminate between different content types, while at another time; the same student reported that the documents with different content types contributed to his learning.

The researcher, during the interviews, observed that the students did not have sufficient knowledge about the concept of content types and that for the first time in their lives the students met such clear-cut discrimination during the blog application.

Although the students were informed about this subject during different phases of the implementation and the content type was written on each presented document in line with the decision taken at the validity committee meetings, it was observed that the students were not able to discriminate between the content types at all. Furthermore, the students sometimes got confused about the concept of content type and the environment types.

"For example, I read the concepts at first. Later, I started reading the other related information because there were concepts I didn't know anything about, and this was not good for me. I thought it could have negative effects on my learning, thus I first learnt the concepts and then read other information." [NK]

"When the concepts are explained through examples, it is better for me and I become more interested in the subject. Thus, it helps my learning, well I understand without getting bored. Well, I'll like it more. But theoretical information really bores me, and I don't want to study then. If it had been one single document, including theoretical information at the beginning and then other related information, I would have just looked at the first page and seen the theoretical information ...then I would have thrown it away without looking at it further." [RO]

The students were also asked if different environment types influenced their interaction with the content.

Most of the students stated that they preferred visual materials. They also reported that these materials were more informative particularly for applied subjects and it would be beneficial to use different environment types for students who did not like reading or did not have the habit of reading. Some students stated that they preferred Web sources since the Web allowed carrying out research, and provided updated information available for sharing. On the other hand, the findings also revealed that some students preferred interaction with written texts.

The students pointed out that sources provided in different environment types contributed to the learning of the students who had different learning types. It was also reported that such presentation of content was more interesting, and prevented the courses from becoming monotonous. However, the students also had negative views about the use of different content types. For instance, it was reported that the Web sources did not always include correct information, and were rather made up of texts. The students put forward several suggestions regarding the development of their interaction with the content. They suggested that the course content be presented in different environments, and there be more focus on visual sources.

The students suggesting that the documents presented in the blog environment not be too long suggested that audio sources could develop their interaction with the content.

"If there were more animations, maybe, there would be more interaction ... Visual elements, PowerPoint presentations ... videos. Perhaps, if there were audio things, it would be better." [AK]

"To me, visuality is very important. Well, the visual quality of the blog was good in general. And if it is in this way, interaction will increase." [ÇD]

Findings Regarding the Development of Social Interaction

In order to maintain social interaction in the blog environment, the Canteen link was used. Besides the subject titles determined at the beginning of the academic term, the students sometimes suggested new subject titles according to their interests. During the interviews, the students were also asked questions which would help them express their interaction with their friends regarding extracurricular subjects in a blog-supported course. The first question was about the effect of the blog-supported course on students' interaction with their friends. When the responses given by the students to this question were examined, it was found that the blog served as a catalyzer which helped the students get more closely acquainted with each other.

Some students reported that thanks to the blog environment, they were introduced to other students whom they had not known before. In addition, the students stated that they overcame occasional communication problems with the help of the blog. The students also pointed out that they shared several social activities like the cinema and trips in the blog environment; however, according to the students, the limited number of social activities negatively influenced their social interaction with each other.

"Well, as I mentioned before ... I learnt the names of friends who I hadn't known before. I started talking with them. Yes, it had positive effects" [FK]

The students put forward several suggestions about increasing the social interaction among students in a blog-supported course. They suggested that the number of social activities be increased and for the planning of such activities, related topics be opened in the blog. Believing that they should show more efforts for the development of social interaction, the students found the canteen part of the blog efficient for social interaction.

"Well, the students were more ... well, there should be more interaction. That's, in the course ... if there had been activities like a picnic, there would have been more interaction." [AM]

DISCUSSION

The students focused on the concept of information sharing with respect to their interaction with each other in the blog activities. The activities carried out particularly within the scope of the courses part in the blog environment enabled the students to share their knowledge and experiences with each other, and increased their interaction levels.

Gülbahar (2005) stated based on student views about the communication tools provided in Web site, opportunities that would allow students to reach information and to participate in discussions should certainly be provided in Web-based environments. This finding supports the concept of information sharing revealed in this study for the development of student-student interaction.

According to the research findings, it was seen that the activities organized with the blog application allowed the students to get acquainted with each other, and increased their existing relationships with the help of interaction.

In addition, the present research findings are also similar to those of another study conducted by Çuhadar and Kuzu (2006) who reported that students made new friends in the blog environment, and in the blog environment, they established interaction with the students whom they had not been able to establish interaction with in class environment. According to the findings of another study carried out by Williams and Jacobs (2004) who focused on student views about the instructional use of the blog, one of the reasons why the students did not want to participate in the blog was the fact that the blog was not worth supporting to participate in. These student views are parallel to the views of some of the students who did not participate in the blog of the ITE-II course due to its artificiality.

Wang and Fang (2005) stated that blogs could be used for cooperative learning tasks that will allow students to work together to achieve their common learning goals. In their study, an increase in the effectiveness of team work and in related social skills was observed. The finding of the present study that cooperation-based team work developed the interaction among the students, and blog-supported courses should include related activities is similar to the findings of the study carried out by Wang and Fang (2005). Activities carried out in the blog environment helped the teacher know the students better and developed the interaction between them.

Hernández-Ramos (2004) reported that blogs and discussion forums are important tools for teachers to know their students. These two findings produced similar results on the basis of student-teacher interaction. According to the related literature, some of the strategies that could be applied to increase student-student interaction were to invite expert guest participants to online courses and to choose a moderator among students (Gueldenzoph, 2003). In this study, the researchers, applying the same method, invited guest instructors to the blog environment and chose a weekly blog moderator. Both of these applications were observed to increase the interaction among the students and with the teacher. In this respect, the findings of the present study are consistent with those reported in related literature.

According to the findings regarding the interaction of students with content, visual materials were observed to gain more importance. On the other hand, Atan, Rahman and Idrus (2004) found that students preferred printed materials more in such learning environments. It is observed that in both applications, the content-related preferences of students were different. The findings obtained in the study revealed that students preferred to ask the instructor their questions in the blog environment – the questions they were unable to ask due to various reasons in face-to-face courses in the class environment. This finding is similar to the findings of the study conducted by Çuhadar and Kuzu (2006) who reported that students asked questions that they were not able to ask in the class and the students were able to reach the instructor out of the class environment.

In the study, another finding obtained regarding the student-teacher interaction was that the students wanted to receive feedback from the teacher about their course-related performances. There are various studies in literature that support this finding. One of these studies was carried out by Jung et al. (2002) who investigated the effects of different types of interaction on achievement, satisfaction, and participation in Web-based learning. In the study, it was reported that the feedback-related interaction between the teacher and the students had a positive effect on achievement.

CONCLUSION

This study aimed to determine how interaction could be developed in a blog-supported way in the course of "Information Technologies in Education II" based on the constructivist learning approach. The study was carried out with 18 students attending the Department of Computer Education and Instructional Technologies at Anadolu University in the Spring Term of 2007.

This Web-based study conducted with an interactive Web 2.0 technology was executed during a period of 10 weeks in the 14-week academic term. The study was designed in an action research type. The research data obtained with the help of different data collection tools such as observation and interviews as well as the findings obtained were contextual.

In this study, it was concluded that the blog use in learning activities organized in line with the principles of the constructivist learning approach developed instructional interaction as well as social interaction. In addition, it could be stated that the implementation process also contributed to the professional development of all the experts and the participants within the scope of the study. The results obtained could be summarized as follows:

The students considered their participation in this study as an opportunity for their professional development.

- **The fact that some students participating in the study did not have their own computers or Internet connection in their accommodation places negatively influenced their participation in the blog-supported courses and their interaction with others.**
- **The students, as a result of their experiences in the blog-supported ITE-II course process, stated that they wanted to participate in online courses in future again. The basic reasons for such a desire of the students were found to be information sharing, contribution to learning, and professional development.**
- **The results regarding student-student interaction showed that regarding the instructional use of the blog, the students focused more on the concepts of communication, information sharing, and better acquaintance with each other.**
- **The students regarded the blog as a tool that helped them learn the lessons better and establish communication with their class-mates and the teacher regardless of time and place barriers.**
- **The preparations by the blog moderators and their management of the activities were observed to increase the levels of student-student interaction and student-content interaction.**
- **Team works increased the level of interaction among the students.**
- **During the weeks/activities that the teacher actively participated in the blog activities, the level of interaction among the students and with the teacher increased.**
- **The students used the blog to communicate more with the teacher, to obtain information and to receive feedback regarding their performances.**
- **The students preferred to interact mostly with the teacher during the activities carried out in the class environment while they interacted with each other during the course activities in the blog environment.**
- **Some students considered the blog as an artificial environment in terms of interaction among individuals.**
- **It was observed that the students got prepared for the face-to-face courses with the help of the activities carried out and with the help of the course content presented in the blog environment. This contributed to their learning and their academic achievement. In addition, the fact that the students recognized the increase in their achievement levels thanks to the blog activities caused them to participate more in the blog activities.**
- **It was found that the students individually preferred different content types in their interaction with the content, and they still did not discriminate between the content types for all the documents and sources provided by the teacher in the blog environment since they considered them important in learning the subjects.**
- **Extracurricular activities contributed to the development of the social interaction among the students and their interaction with the teacher.**
- **The comments that should have been made in the canteen part of the blog were stated under the heading of courses in the blog environment. This was observed to influence negatively the attitudes of the students towards the blog activities who had high levels of participation and who were more enthusiastic about establishing interaction with the teacher.**

Note

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