

CASE STUDY DISCUSSION EXPERIENCES OF COMPUTER EDUCATION AND INSTRUCTIONAL TECHNOLOGIES STUDENTS ABOUT INSTRUCTIONAL DESIGN ON AN ASYNCHRONOUS ENVIRONMENT*

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ABSTRACT

The aim of this study is to reveal opinions and experiences of two Computer Education and Instructional Technologies Departments' students about case study discussion method after they discussed in online asynchronous environment about Instructional Design (ID). Totally, 80 second year students, 40 from Dokuz Eylul University and 40 from Karadeniz Technical University, participated to the study. Communication among students was managed *via* discussion lists. The data were collected with questionnaire, written reports, observations and interviews. The findings indicated that this learning environment made a positive effect on ID knowledge of students. In addition, students stated limitations and positive results of discussing in asynchronous learning environment. Lastly, students suggested some opinions to make this environment more efficient and effective.

Keywords: Computer Education and Instructional Technologies, Instructional Design, discussion list, case study.

INTRODUCTION

Instructional Design Knowledge

"Educational Technology" is a preliminary key concept to understand "Instructional Design (ID)". The concept of "Educational Technology", which is underlying theory of all Computer Education and Instructional Technologies (CEIT) departments in Turkey, has been defined and associated with ID by different scientists studying on the issue. The root of Educational Technology (ET) is attributed to development of three fields; ID, educational media and educational computers (Newby, Stepich, Lehman & Russell, 2006). The Association for Educational Communications and Technology (AECT), the most credible institution about the issue, named the concept with the different dates it has been defined (1963, 1970, 1977 and 1994). The concept has been explained in quite different ways in these definitions (Reiser, 2007; Seels & Richey, 1994; Seatler, 1990). While in early definitions "educational technology" was referred as an educational tool then this definition was strongly criticized and then it was started to be assumed as a process. Along with it was perceived as a process, the principals of instructional design were accepted as the concerns of this field.

The last definition of educational technology is "*the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources*" (Januszewski & Molenda, 2008, p.1). One of the differences of this definition is the word 'ethics'. This term underlines that field experts should respect the professional manner. At the same time, the definition highlights '*improving performance*' as well. One another aim of the instructional technologies is to help students to put the theoretical knowledge and skills they gained into practice. Another function; '*facilitating learning*' tells that students have the responsibility of choosing the things they will learn without focusing on the offered innovation; that is, without focusing how to use technology. In addition the former terms; '*design, development and evaluation*' were replaced with '*creating, using and managing*'. "*Using*" begins with selection and continues with diffusion. And "*managing*" combines the project, distribution network, staff and information management. Finally "*creating*" includes the steps of producing learning environments and instructional innovations including designing, developing and evaluation processes in 1994 definition.

The concept of instructional design and learning are closely interrelated. The effects of all theories explaining learning reflect on instructional design with the application of different instructional strategies. Instructional design, which used to be under the influence of the behaviorist theories and so frequently criticized recently, is

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now shaped by cognitive, constructivist and social theory (Schiffman, 1995). Smith and Regan (2005) define instructional design as “the systemic and reflective process of translating principles of learning and instruction into plans for instructional materials, activities, information resources, and assessments” (p.4). Gagne, Wager, Golas and Keller (2005) simply define that instructional design is “the process for creating instructional systems” (p.18). Concerning all these definitions, one can realize that “instructional design” is a systematical process, which tries to design learning environments so as to provide persistent learning.

The most prominent group who is known for mastering instructional design process in Turkey is CEIT graduates. This has two reasons. First of all, opposing to all other departments, an undergraduate course called “Instructional Design” is offered by CEIT departments. This course provides students with sufficient level of theoretical knowledge about instructional design. In addition to this, quite naturally, educational technologies are concerned thoroughly in CEIT departments. Concerning these factors, it can be understood that how important are CEIT graduates in instructional design process. However, the instructional design is not a one hand process, rather it needs team work. The coordinated operation of the team composed of instructional designer, field expert, evaluation expert and teacher is closely correlated to the competences of team members. Considering the issue from this perspective, the necessity of “Instructional Design” course for CEIT department students can be clearly understood.

Obtaining instructional design knowledge is not simply learning theoretical knowledge associated with teaching and learning or understanding procedural steps of a project. Just like a doctor diagnoses an illnesses and then s/he applies the proper treatment; in order to gain the instructional design knowledge, the young designers should first determine the problem correctly, then they should serve the proper solution as a result of the systematic process they follow and they should test the validity of this solution. Hence, this type of knowledge is practical knowledge which is quite hard to obtain. In order this hard and practical type of knowledge to be internalized by learner, meaningful learning should take place. In meaningful learning, the task assigned to students should include effective, constructive, purposeful, authentic and collaborating activities (Jonassen, Howland, Marra & Crismond, 2008; Grabe & Grabe, 2006; Wiske, 1998). So, concerning the content, it is very important to apply variety of instructional methods and techniques in instructional design course for meaningful learning to be attained. Related to this issue, Mehlinger and Powers (2002) reported that; Internet aided education will carry on the most effective teacher education. They think that teachers will admit the technology that is used for their own learning easier and especially candidate teachers will learn more effectively with the new technology by departing from traditional instructional techniques. For this reason, concerning positive opinions about the results to be obtained and the technology acquaintance of the CEIT students, who are the target group of the instructional design course, it is important to try using the Internet for instruction of this course.

Online Asynchronous Environments

Discussion lists are the electronic environments where people with common interest area exchange information. Thanks to these asynchronous environments, students can come together in different locations and time and they can exchange information. There are studies about the benefits and motivating effects of these environments (Dawley, 2007; Baran & Cagiltay, 2010). There are also some foreign studies investigating problem solving strategies of students by observing students' case analysis about the instructional design on asynchronous environment (Stepich, Ertmer & Lane, 2001; Jonassen & Hernandez-Serrano, 2002). However, since cultural differences are really significant, the question “To what extend is sharing information among CEIT students effective on their learning of “Instructional Design” course?” is still an important question to be inquired in Turkey case. In addition, what kind of effects using technology; particularly the internet, in “Instructional Design” course have on students should also be investigated.

The aim of the study

This study aims to comparatively determine the opinions of Computer Education and Instructional Technologies Department students from Dokuz Eylul University and Karadeniz Technical University about the online case study discussion method after they discussed in online asynchronous environment about Instructional Design (ID). Towards this aim, the answers of the following questions have been sought:

- How do case study discussions affect ID knowledge of students?
- What are the positive results of discussing about a case study in online asynchronous environments?
- What are the limitations of discussing about a case study in online asynchronous environments?
- What are the suggestions of the students about the efficiency of discussing a case study in online asynchronous environments?

METHOD

This study, which was conducted on Dokuz Eylul University (DEU) and Karadeniz Technical University (KTU) Computer Education and Instructional Technologies (CEIT) department students, took place in the spring term of 2008-2009 educational year. Sampling students from two different universities provide researchers with the opportunity of comparison of the data.

The sample

The sample of this study is consisted of 80 Computer Education and Instructional Technologies students, 40 of whom from DEU (10 female-30 male) and 40 from KTU (12 female- 28 male).

The procedures

Implementations were conducted in the Spring term of 2008-2009 educational year, in “Instructional Design” course in the second year of the curriculum. The researchers working for DEU and KTU instructed the course in an identical way by forming a common lecture plan and resources. The content of the course was determined as; definition, components, meaning and significance of instructional design, the origins of instructional design, systematic approach, and the steps ‘analysis and design, development, implementation and evaluation’. Having covered these theoretical scaffolding, students started to present sample lessons they developed in accordance with instructional design model of ASSURE. During this application the students from both universities were expected to participate to online discussions asynchronously. The debates were scattered along two months in the spring term of 2008-2009 educational year.

This study is about the evaluation of online discussion performed in instructional design course. Since it is hardly possible for all students to be in front of the computers at the same time, ‘discussion list’ was used for the study. The students were divided into four groups with 20 members; so as to each group has equal number of students from both universities (Figure 1). The reason of grouping is to reduce the number of students in each group and by this way to avoid too many mails and the confusion among the mails sent to discussion. Two case studies taken from the book called; “*The ID CaseBook: Case studies in instructional design*” by Ertmer and Quinn, were used in these discussions. These two cases were translated into Turkish and the characters in the cases were given Turkish names. The case studies were presenting situations related to instructional design field. The students in the sample were asked; to analyze the cases, to answer the directed questions and to create some alternative ideas related to the solutions of the presented problems.



Moderating discussion groups

In this study, discussion groups were shared between the researchers, in such a way that each researcher had two groups. The researchers read the e-mails that were sent to their groups and participate to discussions if it was necessary. Generally, they preferred staying as an observer instead of replying every single e-mail. The researchers participated to the discussions in the other researcher's groups only when their names were mentioned. The researchers were responsible for sending the case studies to the list, starting and ending the discussions. Additionally, each group was administrated by a student from the group. These administrators were responsible for registering the students to the groups and solving the technical problems faced.

Data collection tools

The data in this study were collected with both qualitative and quantitative means. First, the students were surveyed with a questionnaire about their “Internet using styles.” Then a semi-structured written interview form was prepared. The students filled and sent the form to the researchers after the e-mail discussion session was over. As a result, only 35 students from DEU and 22 from KTU sent their interview forms to the researchers. For this reason the qualitative data coming from the interviews were presented out of 57 students, not 80 although 80

students participated to online discussions. Finally, the classroom observations during the instruction and informal interviews of the researchers were other data gathering tools.

Data analysis

The data coming from the questionnaire were analyzed quantitatively. Frequencies and percentiles were used for this aim and the Internet using profiles of the students were analyzed with Excel application. On the other hand, in qualitative analysis was conducted with the help of HyperResearch 2.6 software. The interview data were analyzed with this software; the codes and themes were formed, and then the frequencies of codes were determined. The data from observations and from informal interviews were used to support the data from the interviews or to eliminate the unnecessary data. The student responses to written interviews were directly quoted in findings section; the students from both universities were symbolized as D₁, D₂, ... D₃₉, and D₄₀ and K₁, K₂, ... K₃₉ ve K₄₀.

Validity and Reliability

Validity and reliability issues in a qualitative natured study are the most important points to make the study credible by other researchers. First of all, different data collecting tools were used to increase the dependability of this study. Secondly, the method of the study was described as detailed as possible to pave a way for the researchers who will study similar topics. In addition, the data were directly collected from the students in computer environment, which prevents data loss. As another factor, qualitative data analysis software was used for the analysis of the data. And finally, the data obtained as a result of the analysis were cross-checked by the researchers.

FINDINGS

Internet using styles

The researchers needed to investigate Internet using styles of the students since the study would be carried out on the Internet by its nature. The data obtained with the questionnaire that was applied to all the students were presented in Table 1.

Table 1. Internet using styles of the students

Questions	Answers	DEU (n=40)		KTU (n=40)		Total (n=80)	
		f	%	f	%	f	%
Do you have your own computer?	Yes	36	90	35	87,5	71	88,75
	No	4	10	5	12,5	9	11,25
Where do you mostly access to the Internet?	Home	20	50	15	37,5	35	43,75
	Dormitory	6	15	7	12,5	13	16,25
	Internet cafe	11	27,5	15	37,5	26	32,5
	Friend's computer	3	7,5	3	7,5	6	7,5
How many hours are you online in a week?	None	1	2,5	3	7,5	4	5
	1-7 hours	11	27,5	16	40	27	33,75
	7-14 hours	12	30	11	27,5	23	28,75
	14>hours	16	40	10	25	26	32,5
What are the things you do most when you are online?	1. thing	Search Engine		Search Engine			
	2. thing	Assignment-Research		Assignment-Research			
	3. thing	Reading News		Reading News			
	4. thing	Watching Movies		Games Watching			
	5. thing	Games		Movies			

With the questionnaire it was examined that; whether the students in the sample have their own computers, where they have Internet access, their total Internet connection duration in a week and what the things they do most are when they are online. In Table 1, connecting to Internet at home ratio of DEU students (50%) and connecting at Internet cafe ratio of KTU students (37,5%) were greater figures comparing to the counterpart group. As another difference between groups, the ratio of Internet connection duration more than 14 hours was 40% for DEU but 25% in KTU. The groups, in general, presented similar Internet using style features.

The Effect of Online Asynchronous Environment on Instructional Design Knowledge

In the written reports the students were asked the question; "How did discussing on cases affect your Instructional Design (ID) knowledge?" Table 2 summarizes the student answers for this question by classifying

with respect to universities and presenting the repetition frequencies of the answers. 89,5% of all students, 57,9% from DEU and 31,6% from KTU reported that case discussions affected their ID knowledge. Additionally, the researchers revealed how ID knowledge changed by classifying opinions under different codes. According to this classification it was determined that the students had some gains in terms of ID like “having a broader point of view”, “associating the theory with the practice”, “understanding problem solving process” and “understanding the aim of the course and ID” (Table 2).

Table 2. Student opinions about the effect of discussions on ID knowledge

Themes	Codes	Repetition Frequencies of the Codes by Students				Repetition Number of Codes	
		DEU		KTU		Total	
		f	%	f	%	f	%
	Yes	33	57,9	18	31,6	51	89,5
	No	2	3,5	4	7,0	6	10,5
Having a broader point of view on ID	Realizing variation of opinions	3	2,4	2	1,6	5	4,0
	Realizing and correcting weaknesses	9	7,2	-	-	9	7,2
	Improving the point of view	9	7,2	4	3,2	13	10,4
	Providing consensus of opinion	2	1,6	-	-	2	1,6
	Acquiring new knowledge	14	11,2	6	4,8	20	16,0
Theory practice relationship	Reinforcing the theory	15	12,0	6	4,8	21	16,8
	Practicing	8	6,4	-	-	8	6,4
	Putting theory into practice	5	4,0	6	4,8	11	8,8
	Persistent learning	7	5,6	-	-	7	5,6
Problem solving process	Researching	3	2,4	1	0,8	4	3,2
	Analyzing information	1	0,8	-	-	1	0,8
	Realizing problems	7	5,6	1	0,8	8	6,4
	Finding solution ways	8	6,4	1	0,8	9	7,2
Understanding the aim	Understanding the aim of the course	3	2,4	1	0,8	4	3,2
	Understanding the importance of ID	3	2,4	-	-	3	2,4

N_{DEU}=35, N_{KTU}=22

When opinions put forward by the students reviewed; “improving the point of view” (10,4%) and “acquiring new knowledge” (16,0%) were frequently repeated items under having a broader point of view about ID theme. In theory – practice relationship theme; positive opinions like “consolidating the theory” (16,8%) and “putting theory into practice” (8,8%) were mentioned. In addition to that, thanks to asynchronous case study discussions, students gained skills like; “realizing and correcting weaknesses”, “practicing” and “realizing problems”. Some quotations from the student answers are given below:

D2: Sometimes, our point of view was extended when another friend came up with a suggestion or solution we couldn't think of.

D1: While we were discussing the case, we had opportunity to discuss about the theoretical knowledge we previously learned in detail.

K3: With the help of the case studies, I had chance to apply the information I gained during the Instructional Design course and I also had opportunity to use them interactively.

D12: The different comments we made about the case studies made my knowledge about instructional design persistent.

However, opinions related to the themes of problem solving process and understanding the aim were less frequently mentioned by the students. In problem solving process theme; “finding solution ways” and “realizing problems” were the commonly discoursed opinions. In “understanding the aim” theme the opinions that this environment helps understanding the aim of the course and understanding the importance of ID were mentioned.

Contrary to positive opinions summarized above, 10,5% of the students argued that online case discussions had no effects on their ID knowledge. To explain this situation, the students remarked that “there were no original ideas”, “there was no share of knowledge”, “discussions were far from being scientific”, “the environment was not suitable for research”, “there were noncreative messages”, “the participants could not understand the relation the cases and the theory part of the course content and “the content of the cases were very complex”. Some of the student opinions are quoted below:

D29: The discussions did not touch any matters out of my knowledge. Before the discussion I was expecting to face with variety of different opinions and approaches however it didn't happen so; as I wanted and expected.

K1: So, since most of the discussions were not directly about scientific information we didn't learn new things. During discussions the participants came up with solutions by using their experience and logic rather than knowledge. This, I think, made the results ineffective.

In sum, the students of DEU feed more positive opinions towards online asynchronous discussion environment than the students from KTU do (Table 2). Still, few students from both universities stated that this learning environment did not affect their “Instructional Design” knowledge (DEU: 3,5%; KTU: 7%).

Positive Aspects of the Learning Environment

The students were asked the question; “What are the positive aspects of the case discussions carried out on the Internet?” (Table 3). Then, as a result of the classification of the opinions obtained from the student answers, the positive aspects of the environment can be listed under these titles; “academic gains”, “social interaction”, “learning environment”, “discussion dimension” and “contributions to personality”.

Table 3. Student opinions about positive results of case discussions on the Internet

Themes	Codes	Repetition Frequencies of the Codes by Students				Repetition Number of Codes	
		DEU		KTU		Total	
		f	%	f	%	f	%
Academic gains	Exchange ideas	17	11,4	7	4,7	24	16,1
	Realizing different points of view	11	7,4	7	4,7	18	12,1
	Finding solution	4	2,7	2	1,3	6	4,0
	Consolidation of knowledge	2	1,3	3	2,0	5	3,4
	Research skills	4	2,7	-	-	4	2,7
	Seeking consensus	3	2,0	1	0,7	4	2,7
	Understanding the issue	1	0,7	2	1,3	3	2,0
	Gaining experience	2	1,3	-	-	2	1,3
Social Interaction	Communicating with other students	14	9,4	6	4,0	20	13,4
	Comparing levels	2	1,3	1	0,7	3	2,0
	Groupwork	2	1,3	1	0,7	3	2,0
Learning environment	Independent from the time	9	6,0	3	2,0	12	8,1
	Independent from the place	6	4,0	4	2,7	10	6,7
	Timesaving	5	3,4	1	0,7	6	4,0
	Internet application in education	2	1,3	-	-	2	1,3
	Storing information	3	2,0	-	-	3	2,0
	Flexible learning environment	1	0,7	2	1,3	3	2,0
Discussion dimension	Learning how to discuss	1	0,7	4	2,7	5	3,4
	Communicating by writing	2	1,3	1	0,7	3	2,0
	Detailed discussion	1	0,7	1	0,7	2	1,3
	Ability to use visuals	2	1,3	-	-	2	1,3
Contributions to personality	Self-confidence	1	0,7	3	2,0	4	2,7
	Participation	1	0,7	2	1,3	3	2,0
	Activating passive students	2	1,3	-	-	2	1,3

N_{DEU}=35, N_{KTU}=22

In the student answers the most frequently repeated positive aspects of the environment were clustered under “academic gains” title. Among academic gains, the most protruding ideas were “exchange ideas” (16,1%) and “realizing different points of view” (12,1%). In addition, the students discoursed positive results like; “finding solution”, “consolidation of knowledge”, “research skills”, “seeking consensus”, “understanding the issue”, and “gaining experience”. Below are some student opinions;

D8: Besides, I've seen once again that my idea or in other words one's own idea may not always be true; listening to others, listening to different ideas and opinions, there are things to learn from them.

K8: We had opportunity to improve our instructional design knowledge and to find new solution ways by generating new ideas and collecting opinions of other students.

K18: This was an environment to apply knowledge we learned during the course.

Another aspect of the issue is this environment let “social interaction” happen. The results showed that the opportunity of “communicating with other students” (13,4%) was perceived as a positive aspect by the students from both universities in the case discussions on the Internet. Besides, this environment gave students the chance of “comparing the levels” of two different universities. “Groupwork” is another positive result mentioned. About the issue, one student noted that:

D21: The most positive result of it to know what our fellows in different universities learn. Sometimes I think to myself what is taught in other universities, what differences we will face when we graduate. This is not only for instructional design course for sure. I got the answer of the question “Where are others, where are we?” for this lesson.

Additionally, the students expressed positive opinions about the “learning environment”. The most frequently repeated opinion about the environment was its “independency from time and place” (8,1% and 6,7%). The students specified other positive aspects of this environment as; “Internet application in education”, “storing information” and its being a “flexible learning environment”. The opinions of two of the students are below:

D2: The most important advantage of discussions on the Internet is that there is no place and time problem. People can join the discussion actively wherever they are and whatever the time is.

D17: Another positive aspect is there was no time barrier. Everybody could check their mails when they were available and join the discussion.

“Discussion dimension” is another positive result reported by the students interviewed. “Learning how to discuss”, “communicating by writing”, “detailed discussion”, “ability to use visuals” were other positive aspects under discussion dimension theme. On this issue, a student said:

D1: One can put things like photos and share with friends on the Internet environment to support his/her idea... Our discussions on the cases affect our lectures positively in terms of using the facilities offered by the computer (picture, video etc.).

The last theme is “contribution to personality”. This theme was detailed by students as; “self-confidence”, “participation to lesson” and “activating passive students”. Two students noted:

K4: Our skills of expressing our meaning to others have improved a little. We improved our reading & comprehension skills by reading and understanding given case studies.

D30: Our friends who are quiet in the class were more active in discussion environment.

It was determined that DEU students mostly repeated the codes like “exchanging ideas”, “communication with other students” and “realizing different points of view” about the case study discussions on the Internet. Similarly, KTU students also mentioned “exchanging ideas”, “communication with other students” and that they are pleased to “realize different points of view”. The students of both universities voiced being “independent from place and time” as a positive side of the environment.

Limitations of the Learning Environment

The question: “What were the limitations of in the case study discussions on the Internet?” was asked to the students. 96,4% of the all students mentioned some limitations but only 2 students from DEU (3,6%) said “there were no limitations”. Having examined the answers, the limitations of the environment grouped under “access problem”, “communication problems”, “technological problems”, “discussion problems”, “time problems”, “first experience”, “personal problems” and “written language problems” theme titles (Table 4).

Table 4. Student opinions about the limitations of the case discussion on the Internet

Themes	Codes	Repetition Frequencies of the Codes by Students				Repetition Number of Codes	
		DEU		KTU		Total	
		f	%	f	%	f	%
Access Problem	Internet access restrictions	15	11,1	11	8,1	26	19,3
Communication Problems	Misunderstandings	6	4,4	8	5,9	14	10,4
	Not face to face	6	4,4	6	4,4	12	8,9
	Unable to give and get instant response	7	5,2	1	0,7	8	5,9
	Not knowing other students	4	3,0	3	2,2	7	5,2
	Unable to interpret psychological responses	5	3,7	-	-	5	3,7
	Unanswered questions	3	2,2	1	0,7	4	3,0
Discussion problems	Overemphasizing the same issue and getting monotonous	7	5,2	3	2,2	9	6,7
	Discontinuity of discussions	2	1,5	3	2,2	5	3,7
	Deviating from the main interest	1	0,7	3	2,2	4	3,0
	Infertile discussion	1	0,7	2	1,5	3	2,2
Time problems	Inability to catch up with the pace of group	8	5,9	3	2,2	11	8,1
	Workload due to other projects	-	-	5	3,7	5	3,7
	Lack of time	-	-	2	1,5	2	1,5
First experience	Being unfamiliar with the application	1	0,7	1	0,7	2	1,5
Personal problems	Thinking the discussion is boring	-	-	1	0,7	1	0,7
	Not being active	2	1,5	-	-	2	1,5
	Anxiety	1	0,7	-	-	1	0,7
Written language problems	Insufficient interaction-communication	5	3,7	2	1,5	7	5,2
	Inability to express thoughts with writing	3	2,2	3	2,2	6	4,4
	Long writings	2	1,5	-	-	1	0,7

$N_{DEU}=35, N_{KTU}=22$

When the student answers are examined, the most frequently mentioned problem by them was “Internet access restrictions” (19,3%). A student stated that:

D6: The biggest handicap was everyone didn't have the Internet whenever they want. For example; I joined the first case very late since I didn't have the Internet connection.

Another frequently mentioned restriction was “misunderstandings”(10,4%) under the “communication problems” theme title. It was observed that the students interpreted different meanings from each others’ written language. For example, a student expressing himself by using exclamation marks was thought as scolding the correspondent. Actually, that student simply meant exclamation. Another important restriction was that the “discussions was not face to face” (8,9%). In addition, the students mentioned a restriction like being “unable to interpret psychological responses” since the discussion was on the Internet. The students also mentioned that they faced problems like; being “unable to give and get instant responses” and “unanswered questions”.

The students also speak out the discussion problems. There were variety of problems like: “overemphasizing the same issue and getting monotonous” (6,7%), “discontinuity of discussions”, “deviating from the main interest”, “infertile discussion”. Some students’ opinions about this issue are presented below:

D36: Since everybody was writing when they want, there might have been some repetitions on topics of discussion. The reason of this was everybody was not checking the e-mails everyday.

D20: Some issues were discussed excessively long and no progress was made.

Time problem of the student adversely affected their participation to the discussions. For this reason, a problem like “inability to catch up with the pace of group” (8,1%) came out. In addition, some KTU students mentioned

about “workload due to other projects” and “lack of time”. Below are some quotations from the students about these issues:

D21: When you want to answer an e-mail, you realize that the topic is already finished; they are discussing some other things. So, you skip that part and try to catch up. This happens when you are not connected to the Internet for a long time.

K1: We could not engage to it properly because of the workload of the other courses and projects. Still, I tried to participate as much as I can.

The students did not know each other before the application. This also had part in the problems of case discussion in asynchronous environment. The students also referred their unfamiliarity with such an application as another restriction. A student said:

D3: The students must have been behaving shyly since they didn't know each other. So, they must have been writing their mails accordingly. At least I wrote in that way.

Some of the students put forward “personal problems” like; “thinking discussion is boring”, “not being active” and “being anxious”. Finally the students pointed out “written language problems” and noted limitations like; “insufficient interaction-communication”, “inability to express thoughts with writing” and “long writings”. The opinions of two students are below:

D35: People may not express their feelings and their meanings similarly and as impressive as one another in their each writing.

K4: We can't fully express our opinions in writing. Personally, I send my writings after reading 4-5 times.

To sum up; the common problem of case study discussion, determined by the participant students from 11,1% of DEU and 8,1% of KTU was noted as Internet access restrictions. It was observed that communication problems was discoursed by the students from both universities. The misunderstandings stemmed from not being face to face particularly mentioned by the students from both universities. While the students from DEU focused on discussions’ “getting monotonous” and “inability to catch up with the pace of the group”, the students from KTU concerned about “workload due to other projects”.

Students' Suggestions to Increase the Efficiency of the Learning Environment

The students were asked the question; “What are your suggestions to make case discussions on the Internet more efficient?” The answers grouped under the theme titles of: “management of the environment”, “case study”, “discussion”, “synchronization”, “social cohesion” and “participation style” (Table 5).

Table 5. The suggestions of CEIT students about case discussions on the Internet

Themes	Codes	Repetition Frequencies of the Codes by Students				Repetition Number of Codes	
		DEU		KTU		Total	
		f	%	f	%	f	%
Management of the environment	Active participation of the administrator	22	15,1	10	6,8	32	21,9
	Student motivation	8	5,5	3	2,1	11	7,5
	Inclusion of the non-participating students	5	3,4	1	0,7	6	4,1
Case study	Simplifying the topic	2	1,4	4	2,7	6	4,1
	Increasing the number of cases	5	3,4	-	-	5	3,4
	Cases appropriate to the culture, interesting and from daily life	6	4,1	3	2,1	9	6,2
Discussion management	Face to face discussion	11	7,5	1	0,7	12	8,2
	(Not) discussing about a matter longer than necessary	4	2,7	3	2,1	7	4,8
	Level discussion	4	2,7	1	0,7	5	3,4
	Short comments	3	2,1	1	0,7	4	2,7
	Extending discussion time	4	2,7	-	-	4	2,7
	Discussing in a single group	3	2,1	-	-	3	2,1
	Different times for discussion and assignment	-	-	3	2,1	3	2,1

submission		1	0,7	2	1,4	3	2,1
	Preventing one to one discussions						
Synchronization	Synchronization	8	5,5	3	2,1	11	7,5
Social cohesion	Mingling students	5	3,4	3	2,1	8	5,5
	Inclusion of different university students	5	3,4	-	-	5	3,4
Participation style	Not grading the participation	4	2,7	4	2,7	8	5,5
	Abolition of compulsory messaging	2	1,4	-	-	2	1,4
	Obligatory (participation)	2	1,4	-	-	2	1,4

$N_{DEU}=35, N_{KTU}=22$

The interviewed students particularly pointed on management of the environment. By means of “active participation of the administrator” (21,9%), “student motivation” (7,5%) would increase and this would provide “inclusion of non-participating student” (4,1%). Here is a student opinion:

K11: To direct students, the instructors should ask critical questions when it is necessary, by means of that the discussion won't stuck and flow of new ideas gets easier.

The students make some suggestions about the selected cases like; “simplifying the topics of the cases”(4,1%) and “increasing the number of cases”(3,4%). In addition students suggested that “Cases, appropriate to the culture, interesting and from daily life” should be chosen (6,2%).

The interviewed students also submitted some suggestions about discussion management. It was determined that the students would like to go on these Internet discussions face to face (8,2%). Moreover, they also suggested; “not discussing about a matter longer than necessary”, “level discussions”, “short comments”, “extending discussion time”, “discussing in a single group”, “preventing one to one discussions”. Few students from KTU came up with a suggestion like “Different times for discussion and other assignment submission” should be arranged.

D18: We can also discuss case studies in the classroom and we can expect more effective results.

D9: The level and manner of the participants should be monitored.

D28: I guess some friends of ours did their best to increase their number of messages. I think the content is more important, one message goes to everyone and everyone can respond it. So we could express our meaning as simple as possible in a message.

Another suggestion mentioned by the students from both of the universities was about carrying out the discussion synchronously (7,5%). The students think that the student participation would increase in a synchronous discussion.

D1: Some definite time may be set and participants may be asked to be connected to the Internet at the same time, the instructor may also be connected at that time to guide participants.

K4: A fixed day is determined and the case study is given in advance so that the participants could research about the case, by this way debaters can prepare better and discussion may become more effective.

Another theme was social cohesion. Some of the students were thinking that the students of the two universities should be introduced to each other in order the discussions to be more effective (5,5%). Some students from DEU suggested discussion groups which students from different universities can participate in (3,4%).

The students also gave some suggestions about the participation style. “Not grading the participation” and “abolition of compulsory messaging” were two of them. On the contrary, some students suggested that students should be made to “join the discussions obligatorily”.

K20: Besides, the activity was done for grade. This hindered the progress. Everybody sent mails without content, just for being sent them.

The data in Table 5 show that active participation of the instructors was suggested by the students of both universities. The students from DEU suggested case discussions should be conducted face to face and synchronous. On the other hand, some students from KTU suggested that the case should be simplified, discussions should not to be converted to grade and different times should be arranged for other assignment

submissions and the discussions. When Table 5 is examined it can be seen that the students from DEU suggested more opinions about online case discussions.

Overviewing the findings, it was determined that Internet using styles of the students from DEU and KTU were similar apart from certain points. The vast majority of the sample thinks that the case discussions on the Internet affected their “Instructional Design” knowledge positively. Exchanging ideas and communication with other students were the positive points of the online asynchronous case discussions mentioned by the students of both of the universities. The most significant problem of this environment was determined as Internet access. A considerable ratio of the students suggested that the instructors should be more actively involved in the case discussions.

DISCUSSION AND CONCLUSION

Instructional Design Knowledge, Case Study and Asynchronous Discussion

In this study, whether the case study discussion in asynchronous environment method affects “Instructional Design” knowledge was investigated in the first place. The results showed that the participants had the general opinion that the method was effective on ID knowledge. In detail, the students said that their vision was extended because of the existence of different universities. In addition, it was revealed that this environment mediated transformation of knowledge between theoretical and practical knowledge. Finally, with the help of the cases some learning gains like the students’ understanding problem solving process and the aims of the course were reached. Bradshaw and Hinton (2004) classified the messages that come to discussion lists into four levels with respect to their content. According to this criterion, the students in general sent messages belonging to the second or third levels. These levels are about agreeing or disagreeing with common results and showing that they are aware of different opinions. Actually, this situation supports the result that small group discussions about a case yield good results particularly in the analysis of the case. That is; the analysis performed by a group of people with different backgrounds gives more successful results comparing to individual analysis (Flynn & Klein, 2001). In a similar study based on communities of practice theory, the researcher investigated whether the candidate teachers gain practical professional knowledge with the discussion list in video based case study method (Baran, 2007). This study proved that; primary school candidate teachers gain practical knowledge; realize different points of view and take lessons from the cases studies in the videos with this method. The guidance role of the educator is quite important in terms of setting discussion environments with high quality in asynchronous discussion environments. Using grades to motivate students is a method applied time to time but, at the same time it is very controversial (Soong, Chan, Chua & Loh, 2001). Additionally, it is also known that timely feedback provided by the instructor increases the student contentment in such environments (Kim, Liu & Bonk, 2005).

In short, the most significant result of this study is the students’ transformation of theoretical ID knowledge into practical with the help of the small discussion groups in asynchronous case study discussion environment. The principal aim of the case discussion is to provide students with experience by making them associating the application in hand with theoretical framework (Ertmer & Quinn, 2003). In this study this aim was managed by discussing about cases with discussion list. Additionally, the difficulty of the transforming theoretical knowledge into practical knowledge was underlined in SECI knowledge transformation model by Nanoka (1994). Accordingly, the effectiveness of the discussion list in terms of transformation of knowledge is a quite remarkable result of this study.

Evaluation of Instructional Method and Tools

One of the most discussed issues in the field of instructional technology is which one has a real effect on learning: instructional medium or the instructional method. From this point of view, asynchronous case study analysis method was employed in this study as instructional method. The instructional medium of the study was discussion list. In addition two universities, two different points of view, came together in the same environment. This design of this study showed that the discussions about case studies related to instructional design and carried out with discussion list method lead some positive results on candidate teachers living in different geographical locations. These academic gains were effective learning in social environment and learning how to discuss. Actually, the literature also mentions that interaction and academic communication makes these environments attractive (Tennent, Hyland, 2004; Kim, Liu & Bonk, 2005; Gursul, 2008; Sarsar, 2008).

This study also ascertains some limitations in discussion lists which arise from asynchronous communication style. These limitations were communication problems, problems coming out during discussions and timing problem. The most frequently mentioned communication problem was misunderstanding. It is evident that misunderstandings are important factors in such online discussions. The most significant solution noted by the students to overcome these problems is conducting discussions face to face. The lack of face to face

communication was also mentioned by different students participated in similar studies (Sarsar, 2008). It is known that, the means like video conference or synchronous chat tools can be used to talk and by this way more proper communication can be managed in non-face to face cases (Kim, Liu & Bonk, 2005).

RECOMMENDATIONS

Backed with the results of this study, we recommend other educators to apply asynchronous discussion on a case study method for providing students with instructional design knowledge. We can look closer to the methods to make this discussion environment more effective:

1. First of all, the most important factor is the mission of a moderator of discussions. The moderator is responsible for rendering discussion environment effective and to adjust environment to yield intended learning outcomes (Stepich, Ertmer & Lane, 2001; Topcu, 2006; Gursul 2008). For this reason, moderators should actively engage discussions and influence the environment with their ideas. When the classroom is crowded, some students from the class should lead the group and guide them. In online asynchronous environments, selecting a leader student or leader students and letting them manage the discussion is a frequently applied practice (Kuzu, 2005).
2. The content of selected cases also affects the quality of discussions. So, launching as many case study discussions as in the term will help overcoming the problems arising from the content of the cases.
3. Too long one to one discussions and paying too much attention to a single topic should be avoided.
4. When there are students from different universities, leaving a longer time for adaptation of the groups is important in terms of their communication.
5. The participation should not be reinforced with grades not to stress them and the number of submitted messages should be kept in a reasonable limit.
6. In this study the students remarked that synchronous environment should be used. Levin, He and Robbins (2006) pointed out that the participants should be given the opportunity of joining both environments by comparing asynchronous and synchronous discussion environments. For this reason, carrying discussions to synchronous environments at times will eliminate the limitations of asynchronous environments.
7. This study showed that all of the students in the class were not participate to this implementation. Apparently, 23 out 80 students stayed away from asynchronous discussion environment. Guler (2007) specified that students with high level of communication in face to face environments do not need to communicate in online environments. Similarly, students who are reluctant to engage face to face communication interact more frequently in online environments. We assume that the findings of the study by Guler would be explanatory while describing the situation of 23 students, who did not submit the written reports.

We hope that this study will be helpful for Computer Education and Instructional Technologies department lecturers in terms of providing instructional design knowledge. We think there is a need for studies to provide instructional design knowledge with different methods.

REFERENCES

- Baran, B., & Cagiltay, K. (2010). The motivators and barriers in the development of online communities of practice. *Eğitim Araştırmaları-Eurasian Journal of Educational Research*, 39, 79-96
- Baran, B. (2007). *Case Study of Online Communities of Practice for Teacher Education: Motivators, Barriers and Outcomes*. Unpublished Doctoral Dissertation, METU, Ankara.
- Cook-Sather, A. (2007). Direct Links: Using E-Mail to Connect Preservice Teachers, Experienced Teachers, and High School Students within an Undergraduate Teacher Preparation Program. *Journal of Technology and Teacher Education*, 15 (1), 11-37.
- Dawley, L. (2007). *The tools for successful online teaching*. Hershey, PA: Information Science Publishing.
- Ertmer, P. A. & Quinn, J. (2003). *The ID Casebook: Case Studies in Instructional Design*, 2nd Edition. Prentice Hall.
- Flynn, A. E. & Klein, J.D. (2001). The Influence of Discussion Groups in a Case-Based Learning Environment. *ETR&D*, 49(3), 71-86.
- Gagne, R. M., Wager, W. W., Golas, K.G. & Keller, J.M. (2005). *Principles of instructional design*. Toronto, ON: Thomson Wadsworth.
- Grabe, M. & Grabe, C. (2006). *Integrating Technology for Meaningful Learning*, New York. Houghton Mifflin Company.
- Guler, C. (2007). Uzaktan Öğrenenlerin E-Postayla Etkileşime Girme Sıklıklarıyla Yüz Yüze Ortamlarda İletişime Girme İsteklilikleri Arasındaki İlişki, Yüksek Lisans Tezi, Anadolu Üniversitesi, Sosyal Bilimler Enstitüsü, Eskişehir.

- Gursul, F. (2008). Çevrimiçi ve Yuzyuze Problem Tabanlı Ogrenme Yaklaşımlarının Ogrencilerin Basarılarına ve Matematige Yonelik Tutumlarına Etkisi, Doktora Tezi, Ankara Universitesi, Egitim Bilimleri Enstitusu, Ankara.
- Januszewski, A. & Molenda, M. (2008). *Educational technology: A definition with commentary*. New York, NY: Lawrence Erlbaum, Inc.
- Jonaseen, D., Howland, J., Marra, R., & Crismond, D. (2008). *Meaningful Learning with Technology*. Toronto: Person Educational.
- Jonassen, D. H., & Hernandez-Serrano, J. (2002). Case-based reasoning and instructional design: Using stories to support problem solving. *Educational Technology Research & Development*, 50 (2), 65–77.
- Kiley, R., (1998). Internet Discussion Lists. *Journal of the Royal Society of Medicine*, 91, 16-17.
- Kim, K.J, Liu, S. & Bonk, C.J. (2005). Online MBA Students' Perceptions of Online Learning: Benefits, Challenges, and Suggestions, *Internet and Higher Education*, 8, 335-344.
- Kuzu, A. (2005). Olusturmacılıga Dayalı Cevrimici Destekli Ogretim: Bir Eylem Arastırması, Doktora Tezi, Anadolu Universitesi, Egitim Bilimleri Enstitusu, Eskisehir.
- Levin, B., He, Y. & Robbins, H. (2006). *Comparative Analysis of Preservice Teachers' Reflective Thinking in Synchronous Versus Asynchronous Online Case Discussions*. *Journal of Technology and Teacher Education*. 14 (3), pp. 439-460.
- Mehlinger, H. D. & Powers, S. M. (2002). *Technology and teacher education: A guide for educators and policy-makers*. Boston, MA: Houghton Mifflin Company
- Newby, T. J., Stepich, D. A., Lehman, J. D., & Russell, J. D. (2006). *Instructional technology for teaching and learning: Designing instruction, integrating computers, and using media (third edition)*. Englewood Cliffs, NJ: Prentice-Hall.
- Newman, P.S. (2002). International Conference on Digital Libraries, Proceedings of the 2nd ACM/IEEE-CS joint conference on Digital libraries, Portland, Oregon, USA, 126-134.
- Nonaka, I. (1994). A Dynamic Theory of Organizational Knowledge Creation. *Organization Science*, 5(1), 14-37.
- Reiser, R. A., & Dempsey, J. V. (Eds.) (2007). *Trends and Issues in Instructional Design and Technology* (2nd ed.). Saddle River, NJ: Pearson Education.
- Saettler, P. (1990) *The Evolution of American Educational Technology* Englewood, CO: Libraries Unlimited.
- Sarsar, F.(2008). Cevrimici Ogrenme Ortamlarında İsbirlikli Ogrenmenin Ogretmen Adaylarının Sosyal Becerilerine Etkisi, Yuksek Lisans Tezi, Ege Universitesi, Fen Bilimleri Enstitusu, İzmir.
- Schiffman, S. S. (1995). Instructional System Design: Five Views of the Field. Ch 11 In G. J. Anglin (Ed.), *Instructional Technology: Past, Present, and Future* (2nd Ed.), Englewood, CO, Libraries Unlimited.
- Smith, P. L., & Ragan, T. J. (2005). *Instructional design* (3rd ed.). Hoboken, NJ: John Wiley & Sons.
- Soong, M.H.B., Chan, H.C., Chua, B.C. & Loh, K.F. (2001). Critical Success Factors for On-line Course Resources, *Computers & Education*, 36, 101-120.
- Stepich, D. A., Ertmer, P. & Lane, M. M.(2001). Problem-Solving in a Case-Based Course: Strategies for Facilitating Coached Expertise. *Educational Technology Research and Development*, 49(3), 53–69.
- Tennent, B. & Hyland, P. (2004). The WebCT Discussion List and How it is Perceived. *Turkish Online Journal of Distance Education-TOJDE*, 5(3).
- Topcu, A. (2006), Gender Difference in an Online Asynchronous Discussion Performance, *The Turkish Online Journal Of Educational Technology*, 5 (4), 44–51.
- Vonderwell, S. (2003). An Examination of Asynchronous Communication Experiences and Perspectives of Students in an Online Course: A Case Study. *The Internet and Higher Education*, 6 (1), 77–90.
- Wiske, M. S. (1998). What is teaching for understanding? In Wiske, M.S. (Ed.) *Teaching for Understanding: Linking Research with Practice*. San Francisco: Jossey-Bass Publishing.