A CASE STUDY OF ONLINE COMMUNITIES OF PRACTICE FOR TEACHER EDUCATION: MOTIVATORS, BARRIERS AND OUTCOMES

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

BY

BAHAR BARAN

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

MAY 2007

Approval of the Graduate School of Natural and Applied Sciences

Prof. Dr. Canan ÖZGEN
Director

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

Prof. Dr. M. Yaşar ÖZDEN
Head of the Department

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

Assoc. Prof. Dr. Kürşat ÇAĞILTAY
Supervisor

Examining Committee Members

Prof. Dr. H. Ferhan ODABAŞI (ANADOLU U., CEIT) _____

Assoc. Prof. Dr. Kürşat ÇAĞILTAY (METU, CEIT) _____

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

Assoc. Prof. Dr. Sinan OLKUN (ANKARA U, ELE) _____

Asst. Prof. Dr. Erdinç ÇAKIROĞU (METU, ELE) _____

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Name, Surname : Bahar BARAN

Signature :

ABSTRACT

A CASE STUDY OF ONLINE COMMUNITIES OF PRACTICE FOR TEACHER EDUCATION: MOTIVATORS, BARRIERS AND OUTCOMES

Bahar BARAN

Ph.D., Computer Education and Instructional Technologies

Supervisor: Assoc. Prof. Dr. Kürsat ÇAĞILTAY

May 2007, 260 pages

The aim of the study was to investigate the dynamics of two online communities of practice (oCoP) for preservice teachers. The research process encompassed three main phases. Phase 1 was related to the design and development of online environment. By the help of existing literature and a pilot study, a portal which is called as "Professional Development Circle (PDC)" was developed. In Phase-2, 28 preservice teachers from three different universities participated to an online course as a part of an undergraduate course. During the term, they discussed on different video cases which were recorded in real classroom environments and produced new lesson plans for these lessons in the light of given suggestions. In the third phase, the same preservice teachers got involved in a different online environment without any grading motivation in the Phase 2. They discussed on some hot topics in mathematics teaching with other preservice teachers, academicians and experienced teachers.

This research study was mainly a qualitative study. Two cases of the study were two oCoP which included mandatory or voluntary participation of preservice teachers to discussions. The data were collected through written reflection reports, observations and

interviews. In addition, private e-mail exchange with participants and discussion list message history were rich data sources. The data were analyzed according to qualitative data analysis techniques.

The design principles and findings of this research study were discussed in the frame of Activity Theory. This study revealed outcomes of two online communities of practice environments in preservice teacher education. In addition, motivators and barriers to be active in oCoP environments were discussed. Some of the motivators were getting more responsibility, self confidance, sociable personality, altruism, sincerity in the environment, and quality of materials while some of the barriers were not wanting to enter a fight, lack of time, the idea “max benefit minimum effort”, feeling availability of others, and Internet access and computer availability.

Keywords: Online Communities of Practice, Knowledge Management, Online Course, Preservice Teacher Education, Activity Theory, Digital Video.

ÖZ

ÖĞRETMEN EĞİTİMİNDE İKİ ÇEVRİMİÇİ UYGULAMA TOPLULUĞU ÜZERİNE BİR DURUM ÇALIŞMASI: GÜDÜLEYİCİLER; ENGELLEYİCİLER VE ÇIKTILAR

BARAN, Bahar
Doktora, Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü
Tez Yöneticisi: Doç. Dr. Kürşat ÇAĞILTAY

Mayıs 2007, 260 sayfa

Bu çalışmanın amacı iki çevrimiçi uygulama topluluğunun dinamiklerini araştırmaktır. Araştırma üç temel aşamadan oluşmaktadır. Birinci aşama araştırma süresince kullanılacak olan çevrimiçi ortamın tasarım ve geliştirme sürecini kapsamıştır. Mevcut literatürün incelenmesi ve asıl çalışma öncesi yürütülen bir pilot çalışma neticesinde Mesleki Gelişim Çemberi (MGÇ) isimli portal geliştirilmiştir. İkinci aşamada, üç farklı üniversiteden 28 öğretmen adayı kendi üniversitelerinde açılan bir ders kapsamında bir çevrimiçi derse katılmışlardır. Dönem boyunca, gerçek sınıf ortamlarında çekilmiş video durumları üzerine tartışmışlar ve video'lara gelen eleştiriler doğrultusunda yeni ders planları önermişlerdir. Araştırmanın üçüncü aşamasında ise, aynı öğretmen adayları gönüllü olarak akademisyenler, öğretmenler ve farklı öğretmen adaylarıyla çevrimiçi ortamda matematik öğretimindeki güncel konular üzerine tartışmışlardır. Öğretmen adayları birinci çevrimiçi ortamda yaptıkları tartışmalardan derslerine etki edecek bir not alırken ikinci ortamdaki tartışmalara gönüllü olarak katılmışlardır.

Bu çalışma doğası gereği nitel bir araştırmadır. Tasarlanmış olan zorunlu ya da gönüllü katılımı gerektiren iki çevrimiçi ortam bu araştırmanın iki durumunu oluşturmaktadır. Veri, yazılı yansıtıcı raporlar, gözlem ve mülakatlar yoluyla toplanmıştır. Ayrıca, araştırmacının özel olarak katılımcılara gönderdiği iletiler ve tartışma listesi arşivi zengin veri kaynakları olmuştur. Verilerin analizi nitel veri analizi yöntemleriyle yapılmıştır.

İki çevrimiçi uygulama topluluğunun tasarım ilkeleri ve araştırmanın bulguları etkinlik teorisi temelinde tartışılmıştır. Bu araştırma, hizmet öncesi öğretmen eğitiminde çevrimiçi uygulama topluluklarının çıktılarını ortaya koymuştur. Ayrıca, öğretmen adaylarının tartışmalara katılımını ve bu ortamlarda bilgi paylaşımını etkileyen güdüleyici ve engelleyici faktörler ortaya konmuştur. Güdüleyicilerden bazıları sorumluluk almak, kendine güvenmek, sosyal kişilik, fedekarlık, ortamdaki samimiyet, ve materyallerin kalitesi iken engelleyicilerden bazıları tartışmaya girmeyi istememe, maksimum fayda minimum çaba, diğerlerinin mevcudiyetini hissetmek ve internet ve bilgisayar erişimidir.

Anahtar Kelimeler: Çevrimiçi uygulama topluluğu, Bilgi yönetimi, Çevrimiçi ders, Hizmet öncesi öğretmen eğitimi, Etkinlik teorisi, Dijital video.

To my parents,
Mahmure and İsmet Öztekin

ACKNOWLEDGEMENTS

This study undoubtedly can not come to this point without the contributions of other people. First of all, I wish to express my deepest gratitude to Assoc. Prof. Dr. Kürşat Çağıltay who proposed me to study on online communities of practice. As my adviser and mentor, he guided on the questions that challenged me throughout the study. Thank him for his insights, critical suggestions and encouraging words.

Secondly, I want to thank those who supported me during my study. First of all, I wish to express my deepest thanks to Assoc. Prof Dr. Sinan Olkun, Dr. Yusuf Koç and Assist. Prof. Dr. Bülent Güven. Without them, I could not bring together the sample of this study from three different universities. In addition, I would like to express my deepest gratitude to Assoc. Prof. Dr. Soner Yıldırım for his help in solving the problems throughout the study and for his great guidance and advice. I would like to special thanks to Assist. Prof. Dr. Erdinç Çakıroğlu for providing the materials used in this study and for his helpful advices and critical suggestions throughout the research. My special thanks go to Çetin Balanuye and Halıcı Yazılım Group for their support for the development of e-learning platform. I wish to express my gratitude to teachers and the managers of Çankaya Turhan Feyzioğlu and Öğretmen Necla Kızılbağ elementary schools for their geniality and helping to record video from real classroom environments. I am also thankful to my friends Esra Yecan, Merve Karayaka, Levent Durdu, Cengiz Savaş Aşkun, Eylem Kılıç. Lastly, I owe a great deal of thanks to my friends and colleagues at the Middle East Technical University for their sincerity and friendship.

Finally, I want to acknowledge my family members for their support and encouragement. I owe my biggest thanks to you. Mum and Dad, let you know that I always felt your support and belief to me from hundreds of kilometers far from me. Banu Öztekin Sarıcı and Ali Sarıcı, you are my closest friends. My special thanks go to you for your great supports, understanding and encouragement. Aynure and Coşkun Öztekin, thank to you unwavering support. Lastly, but most importantly, I would like to express my endless thanks to my husband, Yusuf Baran for his support through this PhD study. Yusuf, thank you for your love and understanding.Thank you one and all!

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS

AT	Activity Theory
CoP	Communities of Practice
DoL	Division of Labor
ICT	Information and Communication Technology
KM	Knowledge Management
MNE	Ministry of National Education
oCoP	Online Communities of Practice
The ILF	The Inquiry Learning Forum
The PDC	The Professional Development Circle
TPD	Teachers' Professional Development

CHAPTER 1

INTRODUCTION

The information revolution and the related economic and social changes are driving forces of shifting to knowledge society. In this transition, The Turkish Ministry of National Education (MNE), serving approximately 16 million students with 600 thousand teachers, has a key role (MNE, 2001; Ozer, 2004). Every year, thousands of students graduate and most of them participate in members of unemployed army in Turkey. There are many reasons of unemployment but one of the main solutions is to educate people effectively. Education is acknowledged as a key for the future. At the end of the day, the quality of education is determined principally by the quality of teaching. People teaching our children and preparing a future for our children are teachers. Therefore, teachers take on more importance than ever before and their professional development has become one of the most important issues.

Teacher education literature indicates that teachers are not satisfied with professional development courses (Ozer, 2004). Regarding this issue, Schaler and Fusco (2003) stated, "Teachers' professional development is more than a series of training workshops, instates, meetings, and in service days. It is a process of learning how to put knowledge into practice through engagement in practice within a community of practitioners."(p.205). In preservice education, preservice teachers are generally full of theoretical information after graduation. However, they need more practice related knowledge. That is, communities of practice environments can be a place to provide practice sharing between inservice teachers and preservice teachers and so, they develop professionally. In this frame, the background of the study is based on a social theory of learning "communities of practice".

1.1. Background of the study

There have been different views about how learning occurs. Three major views are behaviorism, cognitivism, and constructivism. According to behaviorism, dominant from 1900s to 1950s, learning is a proper response to presentation of a specific environmental stimulus affected by environmental conditions including arrangement of Stimulus and Response. According to cognitivism, dominant from 1950s to 1980s, learning is "A mental activity that entails internal coding and structuring by the learner" and affected by learners' thoughts, beliefs, attitudes, and values. According to Constructivism from 1980s to today, learning is "to construct personal interpretation of the world by individual experience and interactions" (Ertmer & Newby, 1993, p.63) and affected by both learner and his/her environmental factors. Learning occurs when collaboration was promoted among learners. In addition, in recent times, communities of practice has been proposed as a social theory of learning that is not a replacement for other theories of learning (Lave & Wenger, 1991; Wenger, 1998, 2002). This theory is built on learning as a social participation. Indeed, it is based on constructivism, whose main principle shifts control from instructors to learners in a social group (Johnson, 2001). In addition, communities of practice are seen as one of the mediators of knowledge management which separates tacit knowledge from explicit knowledge.

OECD (2003) indicated that "the tradition of education system is often characterized as knowledge poor in the sense that education systems still face difficulties in enabling schools and teachers to share jointly develop and implement knowledge about their work and performance" (p.4). That is, educational sector has a huge amount of tacit knowledge and need some incentives to transform this knowledge type into explict one. A community of practice can provide both tacit and explicit knowledge communication among teachers in a community by producing useful documentation, tools, and procedures and shares these documents with other novel teachers. Thefore, establishing communities of practice has become an important focus within teachers' professional development projects and it seems to be a good solution to provide life long learning opportunities (Wenger, 1998).

Since new information and communication technologies have been developed, the idea of using these communication technologies with communities of practice theory for teachers' professional development has raised by instructional technologist. To accomplish that idea, some communities of practice environments have been developed by using web technologies. Some of them are SRI International's Tapped In, The Math Forum, Indiana University's Inquiry Learning Forum (ILF) (Riel & Polin, 2004). Cagiltay, et al (2001)

proposed to use online communities in which teachers share their experiences and practices with other teachers to provide life long learning opportunities for teachers.

1.2. Problems in the area

Senemoglu (2003) investigated existing preservice teacher training applications and problems of these programs. To her study, there are different views between preservice and inservice teachers on undergraduate courses. Preservice teachers believe that they will teach effectively owing to these courses after graduation, while inservice teachers determine some problems of undergraduate courses. Inservice teachers believe that amount of school practice in total preservice teaching curriculum should be increased. In addition, preservice teachers should have a chance of meeting authentic classrooms in different settings. This study showed lack of getting field practice in undergraduate years. In addition, after graduating from university, they are appointed in different schools and experienced different school contexts from eachother. Therefore, teachers are familiar with only their own context, but they need to meet different contexts to develop professionally (Putnam & Borko, 2000). In sum, getting practical knowledge and so tacit knowledge in teaching practice seem to be a big problem to overcome in existing preservice teacher education.

Jacopsen and Lock (2004) discussed that in this knowledge era young people need to be educated in more technology rich environments since they are far from the methods which we were taught. The studies indicated that many university students use information and communication technologies with the aim of learning and a support to their undergraduate courses. Also, they have positive attitudes toward participating technology integrated courses which make them more active. Moreover, most of the instructors evaluate ICT to be useful and necessary for education. (Cagiltay et al., 2007, Gurel, Ülgen, Cagiltay, & Yildirim, 2007; Baran, Kilic, Bakar & Cagiltay, 2005). Although today's university instructors become more technology literate and tend to use it as a support for their courses, many do not know how to integrate technology in their courses. Therefore, integrating technology in teacher education courses has a big potential and has entered in ways of serving more quality learning environments to teacher candidates.

In the literature related to online communities, there are several virtual communities of practice settings which were designed for teachers (Tapped In, Inquiry Learning Forum, Math Forum, etc). These environments have some disadvantages and advantages with respect to eachother (Riel & Polin, 2004; Schaler & Fusco, 2003). In addition, Barab, et al (2004) stated that although there are web tools that provide synchronous or asynchronous

communication in those sites, some group of participants can leave without any message. To make people participate in discussions is very hard task. Therefore, before designing online professional development environments for teachers, examining different cases will provide valuable directions for designers. They will be able to design according to the study's findings. Parallel to this, in recent times the Ministry of National Education has been using educational portal for teachers to introduce them new curriculum. The aims of the portal are to educate students, teachers, and administrators to guide important web sites by some links and search, to provide synchronous or asynchronous education at a distance, and to allow the communication among parents, teachers and students (Aytac, 2004). That is, online learning communities are also a hot topic for the Turkish Ministry of National Education and needs to be designed in detail to become successful. Because of all these reasons; investigating online professional development environments is important.

Barab (2004) determined another problem in area of web based/supported learning environments use in teacher education. To him, researchers generally use a course environment in which participants are reinforced with a grade to grant the finding of their researches. However, the research area needs the investigation of environments in which participants discuss on various topics, voluntarily. Sprague (2006) determined "mandation by universities" as the main reason of teachers' motivation to participate in online professional development. Barnett (2006), in his study aiming to support preservice teachers in examining authentic classroom practice, questions "whether or not preservice teachers who used web supported professional development system in undergraduate courses will continue to use the system after the course concluded" (p.725). He proposed other researcher to investigate this issue.

Another study presented at the American Educational Research Association (AERA) reviewed issues and trends concerning electronic networking technologies for teacher professional development (Barnet, 2002). According to its classification, there are three main theme to investigate web based/supported professional development. The first one is related to reducing teacher isolation and support sharing. Second type studies aim to reveal web based/ supported technologies effect on reflection on practice. And last type research studies aim to investigate the effect of this type of technologies on teachers' practice. In addition, this review determined methodological limitations of web based/supported professional development studies 1) self reported data, 2) little triangulation, 3) short duration and 4) private mails to collect data.

In sum, by taking those summarized issues and concerns of the literature, this study was set up on five main problems: 1) limitation of obtaining practice from the field, 2) unknown motivators which force members in online communities to participate discussions,

3) lack of studies about voluntary participation of preservice teachers in online communities, 4) lack of examples to use technology in preservice teacher training, 5) methodological limitations. In addition, this study is unique in examining dynamics of these types of online professional development environments in Turkey.

1.3. Purpose and research questions

This study investigated both an online discussion environment in which the researcher mandated preservice teachers to participate discussions and another online environment in which preservice teachers participated to discussions voluntarily. This was accomplished by creating and using an educational portal and a discussion list which engaged preservice teachers in practice based discussions. The main aim of the research is to reveal motivators, barriers and outcomes of two online communities of practice environments by investigating preservice teachers' experiences and their perceived opinions. So, the main research question with sub questions is:

Main question: What are the dynamics of two online communities of practice environments in preservice teacher education?

Sub-questions:

1) How do preservice teachers evaluate these two environments?

- As for mandatory term
    - What are the participants' general impressions from online environment?
    - How do the participants evaluate their online experience when they compare it with other traditional courses?
    - What is the online environments' effect on teacher candidates' professional development?
    - What are the potential of the environment for preservice and inservice teacher education?
- As for voluntary term
    - How do the participants evaluate their online experience when they compare it with mandatory term?
    - What is the online environments' effect on the participants' professional development?

2) How do preservice teachers behave in two environments?
3) What are the critical factors influencing amount and quality of participation?
    - What are the motivators?
    - What are the barriers?

1.4. Significance of the study

The main point of this study, "online communities of practice in teacher education" has a diverse significance to investigate. First, one of the problems is that preservice teachers are isolated from each other and they need more practical knowledge before graduating. In this point, researchers revealed that information and communication tools provide huge opportunity to overcome teachers' isolation problem and to enhance their practice. This study can be seen as an attempt to explore solutions for preservice teachers' practice based learning and their isolation problems. Second, knowledge era requires educators use new technologies in their teaching since new generations may learn different from us. They live in more technology rich environments and think more technologically. This study can be a model for other university educators to use information and communication tools in their teaching. Third, using technological tools in preservice courses causes teachers use them in their own classrooms. Because teachers teach by the way they were taught. This study may cause this progressing result. The last reason is that online learning communities is a hot topic in teacher education and there are preliminary positive findings which support educators to use this idea in teacher education.

In the literature, there are some methodological problems in the area of web based/supported research studies. In this study, the researcher would take into consideration triangulation, long duration and private messages issues to increase the reliability and validity of the research studies and thus this study will be different with these characteristics from other research studies.

This study is also important since it presents a complete picture of using online communities of practice in preservice teacher education although existing literature investigated narrower research aims such as either whether or not technological tools affected reflective practice or isolation problem or which technological tools are more effective. Furthermore, almost all research studies require mandatory participation of preservice teachers to online environments. There is lack of research including voluntary participation of preservice teachers to online discussions in the literature. Therefore, this case study will contribute to the body of knowledge since it includes a voluntary participation term in addition to a mandatory term.

CHAPTER 2

LITERATURE REVIEW

This section of the study includes theoretical perspectives of the study and relevant research studies from the literature that the researcher used through the research. First of all, the researcher reviewed what knowledge management is, knowledge types and the knowledge creation model. Then, communities of practice and two examples of online communities of practice from the literature were presented. Thirdly, the main components of activity theory were introduced since this theory gave a theoretical lens to discuss the results of the study. Finally, some evidences showing the importance of using technology in teachers' professional development were presented.

2.1. Knowledge management in teacher education

21st century has been often called as "knowledge age" since we depend on knowledge in all parts of our lives more and more. Synchronously, ways of obtaining knowledge has changed. In this context, the term 'knowledge management' has been popular in management sciences. There is not any common definition of knowledge management although google search finds 46 million web pages related to it. Barron (2000) defined knowledge management by citing from a conference board as,

> An integrated, systematic approach to identifying, managing, and sharing all of an enterprise's information assets, including databases, documents, policies, and procedures, as well as previously unarticulated expertise and experience held by individual workers (p.3).

That is, knowledge management is generally interested in generating, disseminating of knowledge and promoting of knowledge sharing among workers in an organization. Knowledge management is a term originally coming from business. However, over the past a few decades, educational researchers are interested in knowledge management in education (Stevenson, 2000; Glickman, 2004). This does not mean that there was not any knowledge management in educational organizations. Many educators may use knowledge instruments during management of a school or in a teaching activity without knowing this term. In this study, the researcher used knowledge types and knowledge creation model from knowledge management literature through the research. Therefore, in this part, these issues will be outlined briefly in terms of teacher education.

What is knowledge?

In knowledge management literature, researchers are especially interested in what information, knowledge, explicit knowledge and tacit knowledge are. At first, it is important to discriminate the term of knowledge from information. Although these terms sometimes can be used interchangeable, essentially they have completely different meanings. First of all, information is unprocessed knowledge and need to be processed by human beings to be able to become knowledge. We can exemplify information as unripe data in a survey. According to Webster (2001), knowledge is defined as "the fact or condition of knowing something with familiarity gained through experience or association". Nonaka (1994) defined knowledge as "justified true belief". That is, knowledge is an interpreted form of information. From another field, Garud (1997) exemplified himself as an unsuccessful mechanic although he had a vast engineering knowledge. He explained this situation as "…Engineering knowledge comes in different forms and that knowledge of *why* something works does not necessarily translate to knowledge of *how* it is put together. By the same token, I have argued that an expert mechanic may have little knowledge of the principles of engine design that I possess" (p.4). This case can be observed in all professions. As for teaching profession, we can see lots of novel mathematics teachers which do not know how to overcome misconceptions in fraction since they do not know which misconceptions come out while they teach fractions. It can be seen that knowledge requires more deep understanding than being as a concept.

Knowledge was classified into four categories in ancient Greek (Lundvall & Johnson, 1994, OECD 2004, Garud, 1997): know what, know why, know how and know who. Know what is related to facts in the world. As mentioned above, it is close to information. For instance: knowing the population of Turkey, the date of the World War II or the distance between Ankara and Istanbul, etc. As for education, how many learning theories

there are in the literature, the date of promulgation of new Turkish curriculum or the types of intelligence according to Gardner's multiple intelligence theory are examples of this kind of knowledge. Owing to this type of knowing, teachers learn information about the realities in educational system.

Know why and know how are more complex knowledge types than being know what. Know why is related to principles and laws. This process as "learning-by-studying". It comes out especially in technology related areas and focuses on understanding principles and laws about how things work. As for education, teachers know the learning theories which explain how learning occurs.

Know how is related to skills and ability to do something. This knowledge type come out through learning by doing (Arrow, 1962; Argote & Epple, 1990; Garud, 1997). It has a cumulative structure and so prior knowledge has a diverse place. Know how sometimes remains tacit while it can be explicit by scientific studies. For education, teachers can judge possible results of a new application in teaching. That is, know how requires practical knowledge rather than theoretical knowledge.

Lastly, know who refers to information about who know and who know what to do. This knowledge type is related to teachers knowing the one who they can consult when they encounter a problem.

In teacher education, educators are mainly interested in whether knowledge has gained or not. Therefore, it is important to understand the process of knowledge creation. According to Polanyi (1966), there are two types of human knowledge: *explicit* (codified knowledge) and *tacit (non codified)*. Polanyi makes difference among these knowledge types with these words "we can know more than we can tell (cited in Nonaka 1994, p.16). Tacit knowledge is a kind of knowledge that is hard to take a shape and transmit to other people. It has both cognitive and technical elements. Cognitive elements provide human beings to understand and perceive their world while technical elements are related to crafts and skills can be applied in specific context (Nonaka, 1994). Explicit knowledge is more simple knowledge type. In education, increased tacitness in knowledge makes it difficult to share it. These two dimensions of knowledge creation have an important role by interaction of teachers working in a school. In its nature, tacit knowledge can not be transferred into explicit. However, owing to incentives sometimes tacit knowledge becomes explicit automatically. Taking into consideration of know how, know why and know what, the most tacit knowledge type is know how. Know what can be seen in books or databases and know why in theories or principles while know how has remained poorly articulated. The benefit of making explicit knowledge tacit knowledge is to make easy of mediating knowledge (OECD, 2000).

OECD (2000) report stated that education sector has a huge amount of non codified knowledge. Table 2.1 shows that the sectors including advance research and development studies have more codified knowledge base such as biotechnology while in educational sector codified knowledge is very low because of R&D remaining secondary level. This analysis revealed that there is low success of educational sector in knowledge creation, mediation and use.

Table 2.1

The place of the education in tacitness, OECD (2000), p.20.

	Competitive environment	Non-competitive environment
Knowledge is poorly articulated (tacit)	Consulting activity	**Education (teacher)**
Knowledge is highly codified	Biotechnology	Higher education Library management

Being investigated the ways of obtaining knowledge in schools, teachers obtain explicit knowledge by reading books, handouts, regulations, etc and they construct tacit knowledge by imitating, observing, or chatting in a social environment (Brown & Duguid, 1991). Therefore, it is clear that socialization has a critical role to obtain tacit knowledge. In that point, to understand how this knowledge types can be transformed to each other is important.

The knowledge creation model

In this study, the model of Nonaka's SECI knowledge creation model has been discussed. According to the theory, the process of knowledge conversion proceeds through four different modes,

- **S**ocialization (tacit to tacit),
- **E**xternalization (tacit to explicit),
- **C**ombination (explicit to explicit),
- **I**nternalization (explicit to tacit).

During the *socialization* mode, tacit knowledge is transferred to tacit knowledge through interactions among individuals in a community. That is, learners may learn by observing behavior modeled by others. Mentoring may instruct tacitly through observation, imitation, and practice (Best, Hysong, McGhee, Moore & Pugh, 2003). For example,

preservice techers are expected to learn mentor teachers' practice by observing them in practice schools. The *externalization* refers to knowledge conversion of tacit knowledge into explicit (Nonaka, 1994). It means articulating of thought' through language. For teacher education, in traditional school practice courses, preservice teachers reflect their thought by writing can be an example for this mode of knowledge creation. The *combination* mode of knowledge conversion embodies the aggregation of multiple examples of explicit knowledge (Nonaka, 1994). Explicit knowledge may be exchanged during meetings or conferences in which a diversity of knowledge sources combines to shape a new and enhanced conception. The *internalization* mode occurs when concrete knowledge absorbed as an integral belief or value. For internalization, learning and action plays an important role. Internalization represents an active process of learning.

2.2. Communities of practice

Communities of practice (CoP) is one of enablers for knowledge management. In addition, CoP moves a first step beyond as motivator of tacit-explicit or reverse knowledge transfer among people owing to using the Internet based innovations such as e-learning, web conferencing, collaborative software, content management systems, corporate, e-mail lists, wikis, blogs, etc (Wikipedia, 2007). Theoretical framework of communities of practice provides in detailed knowledge to understand how learning is achieved in social environments.

> Only by engaging in work and talking about the work from inside the practice, one can learn to be a competent practitioner. Practice is an effective teacher and community of practice is an ideal learning environment. (Schlager & Fusco, 2003, p. 203).

In this part, the idea of online communities of practice (oCoP) will be outlined and two famous online communities of practice platform will be introduced. The term "Community of practice" was first coined by Lave and Wenger (1991) in their discussion of the social nature of learning. The basic argument made by Jean Lave and Etienne Wenger is that communities of practice are everywhere and that we are generally involved in a number of them - whether that is at work, school, home, or in our civic and leisure interests. In some groups we are core members, in others we are more at the margins (Wenger, 1998). Wenger (2002) describes communities of practice, *"*Groups of people who share a concern, a set of

problems, or a passion, about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis." (p.4).

In recent decades, there are some attempts to use communities of practice theory in online learning environments. There are a lot of phrases to describe new forms of social online learning; learning communities, communities of learners, learning circles, learning organizations, knowledge communities, communities of practice, professional community, and learning organizations. It can be seen in the literature that these terms can be used interchangeably. But in fact each of these terms has different aspect of social learning (Barab, Kling & Gray, 2004; Riel & Polin, 2004). Riel and Polin (2004) describe three different but sometimes overlapping types of learning communities to provide a common language for understanding the different forms of social organizations. These *are task based, knowledge based, and practice based learning communities*. They examine the types of learning communities according to their membership features, task features, participation structures, and reproduction and growth mechanism.

Firstly, *task based learning community* aims to produce a product or outcome and their member knows each other. These groups generally are temporary groups whose members try to accomplish well-specified tasks. A small group interaction occurs among members of the group. Learning Cycles supported by The International Education and Resources Network, Thinkquest sponsored by Network Learning Services, Indiana University's Inquiry Learning Forum or SRI International's Tapped In, are some of the collaborative tools whose aim is to accomplish a task. Secondly, *knowledge based learning communities* try to advance the collective knowledge in a field. Members of it may or may not know each other personally. There is a long-term commitment to construct knowledge base. Lastly, *practice based learning community* differs from task based community mainly by voluntary participation. There is a shared activity among members of the community to produce knowledge. Tacit knowledge is shared among members. Mathforum, Tapped In, ILF are some of the collaborative tools using in practice-based communities. These types of communities often called as communities of practice (Riel & Polin, 2004).

While practice-based communities are described as one type of learning communities by Riel and Polin (2004), they can be used interchangeably with other learning communities in the literature. ILF' research groups defines online CoP as a persistent, sustained social network of individuals who share and develop an overlapping knowledge base, set of beliefs, values, history, and experience focused on a common practice an/or mutual enterprise (Barab, Makinster & Scheckler, 2004).

Two examples of learning communities

Over the past 10 years, many online learning communities were established on the Internet. In this part, two well known learning community platforms will be introduced to explain how knowledge management and communities of practice have been achieved in the Internet environments. These are Tapped In and Inquiry Learning Forum (ILF).

TappedIn (http://tappedin.org/tappedin/)

In 1990s, there were limited notable projects on teachers' professional development (TPD). One of them is the Math Forum (http://mathforum.org) which provided only asynchronous communication among its visitors. In those years, TappedIn, which is created by SRI International, has been unique TPD environment providing real time communication opportunities. This multi-user virtual environment enables teacher educators to offer high-quality online professional development courses. Schank, Fenton, Schlager and Fusco (1999) determined their main aims as "1) investigate the resources and technological support that TPD efforts need to conduct professionally valuable on-line activities; 2) develop innovative TPD models that integrate face-to-face and asynchronous interaction with collaborative synchronous on-line activities; and 3) identify social, motivational, and technological factors that contribute to the success and evolution of our on-line TPD community concept" (p.518). They linked the theoretical background of TappedIn to collaborative works which is based on online communities of practice. Today, the learning environment still continues to develop from the initial design (Schlager & Schank, 1997; Schank, Fenton, Schlager & Fusco, 1999).

TappedIn is designed around a metaphor of campus having buildings. There are two campus as TappedIn campus and K-12 student campus. Online activities take place within virtual buildings within the Tapped In environment (Figure 2.1). Each building includes different organizations and each building typically has three floors:

1. A ground floor with a reception (where members find help desk staff and news) and other public rooms (conference rooms, etc.).
2. A second floor with group rooms, which can be open to the public, moderated, or totally private. Group owners can assign moderators and permissions to group members.
3. A third floor with personal offices for members affiliated with the organization. (tappedIn)

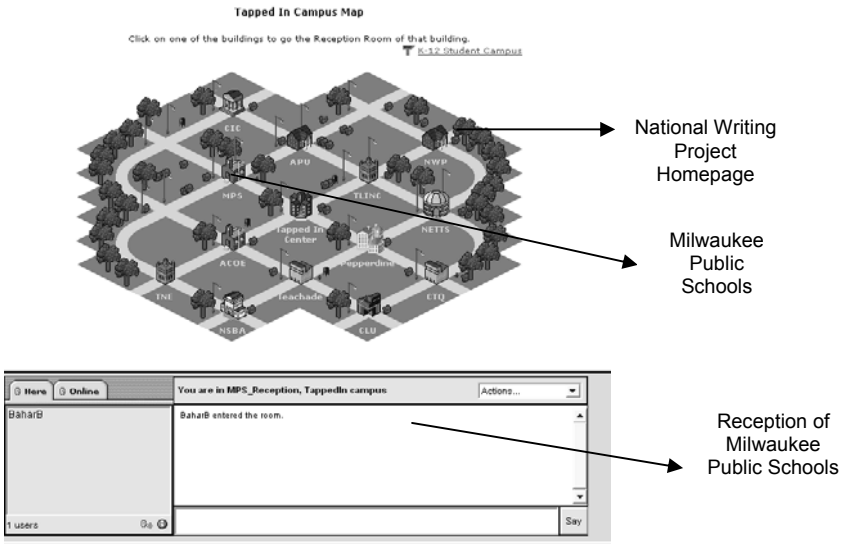


Figure 2.1 The virtual campus of TappedIn.

Inquiry Learning Forum (ILF - http://ilf.crlt.indiana.edu/)

The Inquiry Learning Forum (ILF) is an online community created by Indiana University for K-12 teachers and administrators, pre-service teachers, and educators. Moore and Barab (2002) have defined the general scope of the *ILF "a research and instructional design effort centered around Internet based professional development*" (p. 45). Its name "the Internet Learning Forum" has been changed as the Inquiry Learning Forum to emphasize inquiry based teaching methodologies, which is the main aim of the project, instead of emphasizing its technical background. The ILF gives opportunities to visitors to observe their colleagues' classrooms owing online streaming videos and to discuss on inquiry based activities and other free topics. So, the ILF designers expect that each participant develops their professional knowledge in a social context. Its theoretical background has composed from situated cognition and communities of practice (Barab, MaKinster, Moore & Cunningham, 2001; Moore & Barab, 2002).

The ILF has been designed around a school metaphor. The design team preferred to use this metaphor since they want to make the environment to look like real life learning places in which pre-service teachers, novice teachers and veteran teachers already get experience by interacting with each other. Their initial research studies showed that the expectation of these three groups of teacher was the same. A bit difference was that pre-service teachers wanted to obtain lesson plans and to view classroom management strategies in real classroom environments while in-service teachers wanted more specific knowledge

related to curriculum or teaching strategies. Based on this need analysis the project team let graduate students design initial interfaces of the environment. After, they received three years funding from National Science Foundation (NSF) in 1999, they began to work with science and mathematics teachers to get feedback about both technical and pedagogical design issues. Technical issues are related to interface complexity. Furthermore, they wanted to view teachers having good teaching skills and criticized bad teaching in the videos. So, a new interface version using of a school floor plan metaphor were designed instead of using floating school doors. From this time, the ILF had lots of iteration and has continued to develop (Barab, MaKinster, Moore & Cunningham, 2001; Moore & Barab, 2002).

Today, the ILF web site presents several opportunities by visiting school based rooms (Figure 2.2). So, visitors can obtain or share lesson plans, view real classroom video examples of fellow teachers, engage in online discussions, and work online with groups focused around a particular topic or idea. The ILF consists of following rooms: Inquiry Lab, Collaboratory, Lounge, ILF Office, Classrooms, My Desk and Library. Inquiry Lab includes various professional development activities focused on inquiry teaching**.** In this part, the participants can learn what inquiry based instruction is, owing to professional development activities. The Collaboratory is the location for the Inquiry Circles. The participants can work with others on lessons or share their ideas and lesson plans. They can be a restricted area by the group facilitator. The Lounge is a place where the participants can synchronously chat with other members, and discuss on different teaching topics, asynchronously. In The ILF Office, the participants can go for help and information. In Classrooms, the participants can view other teachers' classrooms, discuss how to do inquiry, view lesson plans, and view students work. My Desk space is the participants' personalized area in the ILF. They can organize personal information and view their Inquiry circles, discussion forum, activities and ILF classrooms. The ILF Library has lesson plans, unit ideas, activities that you can use in your classroom, and links to websites.

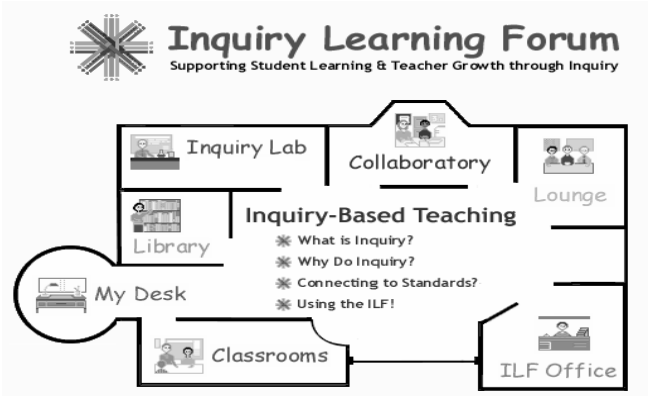


Figure 2.2 The school metaphor of the ILF.

After Barab, Evans and Baek (2003) present instructional technologist why and how they should use activity theory in their research studies, in 2004 Barab, Schatz and Scheckler used Activity theory as an analytical lens for characterizing the process of designing and supporting the implementation of ILF. They propose 3 main implication: 1) AT can provide a useful analytical tool for characterizing design activity 2) in community like environments, the members' existing culture challenge with design issues and so many tension emerge, 3) consideration of the ILF as a socio technical interaction network was necessary to understand the ILF.

Baek and Barab (2005) investigated design dualities in a web-supported community of practice for teachers. Five dualities are: purpose (school reform v. daily support), design approach (design for v. design with), usability (simple v. complex), social (public v. private), and boundaries (inside v. outside). For the Purpose duality, the results showed that the platform should support teachers' daily needs. This could be done by sharing resources that have relevancy and which are useful to their practice. For the design approach, "designed for" indicates the approach in which the designers took leadership in the design process. "Design with" is the approach in which the teachers took ownership in the process. The results indicated design with was an extremely complex issue. Teachers' perspectives tended to be limited. For usability, there were complaints about the complexity of navigation and viewing video. Therefore, the research team developed the "help" section including video help and ILF help. But even they had especially serious problems with videos. The process of meeting the teachers' needs created technical and utility problems, which decreased their use of the site. For social contingencies, the participation to discussion was low. There is insufficient critical reflection. The main barriers to participate discussions are lack of trust, absence of reflection in their life, afraid of judging or being criticized by others. Therefore, they used onscreen teacher since these teachers' invitation to discussions will be acceptable for teachers. In addition, they created "my profile part" on the portal. In addition building small, private communities where a group of people with shared interests could come together and produce something that was useful for their teaching, such as lesson plans, in a more intimate place. Boundaries duality is related to construction of working group. The groups should be spontaneous or determined. In the beginning, they got support of educational institutions in state wide although in the following time, the ILF has been a place for all teachers.

Makinster, Barab, Harwood and Anderson (2006) examined the effect of social context on preservice teachers' written reflection. The results showed that three different online setting a) a private journal, b) asynchronous discussion forum and c) a discussion forum within a web supported community of teachers caused reflections in different forms.

As a conclusion, they propose reflecting on one's teaching by participating in online discussions with experienced others. The preservice teachers in web supported community of teachers draw their experiences from other teachers and contribute to resources of other teachers. That is, they viewed their participation valuable. However, they reported that preservice teachers bothered public nature of ILF lounge.

2.3. Activity Theory as a theoretical framework for analysis

Activity Theory is "a philosophical and cross-disciplinary framework for studying different forms of human practices as development processes, both individual and social levels interlinked at the same time" (Kuutti, 1995, p. 23). This theory is a sociocultural theory which helps researchers to examine an individual in a large activity system. That is, rather than investigating an individual by isolating her/his from context, minimal meaningful context must be included in the basic unit of analysis (Kuutti, 1995). Therefore, activity theory framework is a useful analytical lens to understand social structure of particular online environments since it allows to see a learner both in an individual group and in a large community (Engeström, 1999; Barab, Barnett & Squire, 2002; Barab, Evans & Baek, 2003; Schlager & Fusco, 2004; Barab, Schatz & Scheckler, 2004).

Activity theory has entered in different technology related research area from several years; human computer interaction (Kuutti, 1995; Kaptelinin & Nardi, 1997; Kaptelinin, Nardi & Maculay, 1999), teachers' technology use (Lim & Hung, 2003; Demirarslan, 2005; Kelçeoğlu, 2006), etc. In this study, the researcher discusses the findings of this study from the activity theory framework to understand the dynamics of two online communities of practice environments which were developed for preservice teachers' professional development. In the following paragraphs, this theory's historical development and the key principles will be outlined.

Historical development of Activity System Model

Activity theory has mainly its roots from three important origins: 1) German philosophy (from Kant to Hegel), 2) in the writings of Marx and Engels, and 3) cultural historical psychology of Vygotski, Leont'ev and Luria (Kuutti, 1995; Engeström, 1999, 2001). However, especially studies of Vygotski and Leontev have direct effect to the development of activity theory. Therefore, most of the publication and research studies cite these people. The publications which met us activity theory are *Learning by expending* (Engeström, 1987) and *Activity, counciousness and personality* (Leont'ev, 1978). These

books have a key role for the dissemination of activity theory since they are first English written books. So, after 1990 the frequency of activity theory keyword in SSCI article has increased dramatically. Although there is an increasing trend in research studies which use activity theory, the potential of cultural historical activity theory has not yet been realized (Roth, 2004).

In the development process of activity theory, there are three main generations. The first generation of activity theory drew heavily on the work of Vygotsky's conception of 'mediation' (Vygotsky 1978). Figure 2.3 shows Vygotski's famous triangular model in which the relationship among subject and object and tool revolves to mediate the interaction. This theory is in contrast to behaviorist roots which accept there is a direct link between object (stimulus) and subject (response) (Barab, Evans & Baek, 2003). The limitation of this first generation was that the unit of analysis remained individually focused (Engeström, 2001; Uden, Kumerasan & Salmenjoki, 2007).

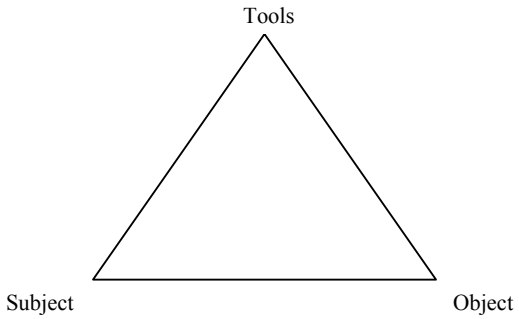


Figure 2.3 A basic formulation of human activity by Vygotski (cited in Engeström, 2001).

The limitation of first generation activity theory was overcome by Leont'ev' s studies which are accepted as second generation. Leont'ev explains differences between individual action and a collective activity by exemplifying 'primeval collective hunt'. Operation, action and activity are three hierarchical levels to distinguish between immediate action and the larger activity system. Kuutti (1995) explains this level with an example from scientific research studies: Activity (carrying out research into a topic) action (searching for references, participating in a conference, writing a report), operation (using logical syllogism, selecting appropriate wording). That is, three hierarchical levels refer to "cultural, conscious and automatic levels of behavior", respectively (Barab, Evans & Baek, 2003, p.202). In this study, these levels were not used explicitly but their traces can be observed through the results. In spite of this famous works, Leont'ev never produced any graphical representation of the ideas (Engeström, 2001). Engeström (2001) depicts Leont'ev's ideas in

a figure similar to Figure 2.4. Synchronously with Vygotski's model, the relationship between the subject and object which is mediated by tools remains stable. He moves a step beyond this model by adding new elements to the model: Rules, Community, and Division of Labor. Therefore, he reflects human activity in a large system. So, he shows activity by subject- tools- object, subject-rules-community, object- division of labor- community (Kuutti, 1995). Today, this model is shown with two reverse arrows between two components of the system. So, different kinds of triads from six components can be produced (Barab, Evans & Baek, 2003, p.202).

Engeström (2001) defines the third generation of activity theory "…needs to develop conceptual tools to understand dialogue, multiple perspectives and networks of interacting activity systems" (p.135). This generation of research studies includes minimally two interacting activity system. From one activity to another, the object develops from a general state to jointly constructed object step by step. In this study, the researcher developed two activity systems similar to third generation activity theory researches. The subject and object in two activity system is stable while the other elements change.

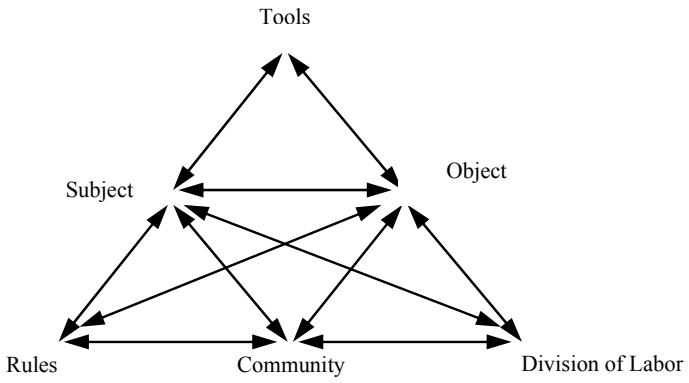


Figure 2.4 The structure of human activity (Engeström, 1987, p. 78).

Components of the activity theory are as follows:

- **Subject:** In the model, *subject* is an individual or a group of people having an object (Nardi, 1995; Jonassen & Murphy, 1999). In this study, preservice teachers have been the subjects of the activity system.
- **Object:** Object in the activity system can be a manipulative or a thought (Nardi,1995; Jonassen & Murphy, 1999). The subject aims to achieve the object owing some mediators and object motivates the activity (Nardi,1995). For this study, the object of the

activity system knowledge sharing and knowledge creation in mathematics teaching practice.

- **Outcome:** Outcome is expected results of the object. In this study, outcome is the better understanding of mathematics teaching practice by achieving knowledge sharing and creation in the system.
- **Tools:** Tools can be materials or signs (psychological) (Kuutti, 1995). The relationship between subject and object is mediated by tools. In this study, tools are the components of the portal which was developed for people interested in mathematics teaching.
- **Rules:** The rules are general principles and conventions in a community (Kuutti, 1995). Indeed, the rules provide to be a member of community. For example, in this study, rules are researcher oriented or community oriented. For example, at least three message sending necessity to the discussion list in each discussion period is a researcher oriented rule while extended discussion durations are a community defined rule.
- **Community:** In the activity system the subject is a member of larger group. In the process of reaching the object, the subject. Therefore, the community of this study is preservice teachers, academicians and teachers out of the subject.
- **Division of Labor:** The division of labor is a specialization of existing actions for transforming object in to outcome. That is, in a collaborative effort, every member has different actions. Bringing together these actions mediates the relationship between subject and object. For this study, the researcher gave different responsibilities to each university to be able to mediate the relationship between preservice teacher and knowledge creation and sharing.

2.4. Some evidences showing the importance of using technology in teachers' professional development

In the past, teachers generally improved their practice on the job after they were equipped with theoretical knowledge in undergraduate years. In recent years, teacher educators take attention the idea that teachers should practice in the field before they begin teaching profession. So, nowadays, in preservice teacher education three popular approaches have been the focus of the educational researchers. These approaches are collaborative reflection, case studies and guided apprehenticeship in the field (Wang & Hartley, 2003). In addition, teachers are isolated from other professionals as result of geographic location and they have limited opportunities for collaborative face to face discussions (Kurtts, Hibbard & Levin, 2005). Many researchers revealed that technology has been an easy and effective way

to present this kind of environments to preservice teachers and to help to overcome isolation problems (Hawkes & Romiszowski, 2001; Barnet, 2002; Wang & Hartley, 2003; Sumsion, Patterson, 2004; Khan, 2005; Davis & Roblyer, 2005; Sprague, 2006; Levin, He & Robbins, 2006; Barnet, 2006; Lock, 2006; Simpson, 2006). More specifically, Barnet (2002) said for teachers' professional development networking technologies have great importance in teacher education since owing to this tool teachers can access ongoing, quality professional development and they communicate, collaborate and reflect on their teaching. Sprague (2006) exemplified several models for online teacher education program. In addition to informal efforts which use e-mail, discussion boards, case study discussion or course web sites to support their teacher education courses, there are some web based efforts supported by formal institutions. To her, all models aim to improve teachers' understanding of learning and to change their practice. In this point, for teacher educators, the curriculum of teacher education is rich enough to use new pedagogical approaches. However, faculties can be weak about the integration of new technologies to learning. Therefore curriculum developers should take into account all possible ways to integrate ICT in education. So, it is important to conduct new research studies about this topic to guide curriculum developers (Tanyeri, 2007).

Moreover, Mehlinger and Powers (2002) stated that distance education technologies in teacher education courses increased professional development capacity for preservice education, provided quality teaching and learning opportunities and gave an opportunity to distribute the teacher education courses in a more effective way. Another study revealed that preservice teachers were confident in their abilities to use educational technology and talk about the benefits of using technology in teaching but they are not ready to move these ideas into practice (Swain, 2006). In addition, educators direct researchers to investigate the results of technology based education on preservice teacher' prospective teaching life since they believed that this type of learning by modeling of university education had a big potential to provide teachers' use technology in their own classroom (Mehlinger & Powers, 2002; Barnet, 2002; Bullock, 2004; Jacobsen & Lock, 2004; Draper, Smith & Sabey, 2004). In other words, in addition to main aim of web based teacher education courses, which are mentioned above, educators expect teacher candidates to use technology in their classroom as being in their experiences. We face with this benefit as a vague result of web based teacher education courses.

2.5. History of teacher education and importance of oCoP for Turkey

In Turkey, formal education includes steps of pre-school education, primary education and secondary education. Services related to pre-school education are given by kindergartens and foremost by the Ministry of National Education. Primary education is compulsory for all citizens, boys or girls between 6 to 14, and is free of charge in public schools. Secondary education includes all of the general, vocational and technical education institutions that provide at least three years of education after primary school. There are currently 16,090,785 students at the levels of pre-primary, primary and secondary education. The number of teachers employed is 578,805 (MNE, 2001).

Historical background of teacher education in Turkey

Turkish teacher training politics have shown some important changes in her history. With establishment of new republic, Turkey entered a new modern term in 1923. The government invited John Dewey, who was the first foreign adviser being consulted about arrangement of educational system (Akkutay, 1996). He prepared two reports, which has been historically important in the development of modern Turkish educational system. The first report includes information about the importance of teacher training and funding of education and second report includes specific recommendations. Related to the teacher training he determined the major problems as,

> "The problem of attracting to the teaching profession the right of intelligent and devoted men and women and equipping them with both knowledge of subjects taught and with modern and progressive pedagogical ideas is the crucial problem" (cited in Turan, 2000, p.551)

In addition, he emphasized the importance of distance education and specifically proposed to use correspondence courses or sending teachers abroad to be able to train (Turan, 2000). After years in a congress on teacher training, the academicians, who composed of both important decision makers and educators, discussed the problems of Turkish teacher training in the restructured system (Ozbay, 2005). This showed that teacher training have still problems. In this section, this transition will be discussed.

In 1930s, the regulation 'Law of Unification of Instruction' was promulgated. So, The Ministry of National Education (MNE) has been unique institution which operates

educational policy and administrative decisions. This centralized system was criticized by some writers that they discussed Dewey's cautions to it (Turan, 2000).

In 1940s, teacher training was realized by village institutes. Duration of these institutions was five years after primary school education. The major aim of them was to educate both teachers and people who would contribute to the development of villages. This institution has been a model in the history of Turkish teacher training and discussions on this model has continued (Baskan, 2001).

In 1974, two year post secondary education institutes started to train teachers owing to basic Law for National Education (Milli eğitim temel kanunu) (Cakiroglu & Cakiroglu, 2003). So, teacher training first was taken into account according to higher education principles.

The last major change is related to the institution providing teacher education. In 1981, a regulation which was promulgated with the number of 2547 required that teacher education was in the responsibility of the universities (CHE, 1981). So, two year post secondary education institutes named after Higher Teacher Schools. The duration of the teacher education program has been four years in 1989. Then, 1992-1993 academic years, these institutions have entered under educational faculties (Baskan, 2001).

In following years, by some research studies on this new application, it was understood that there has been some problems in teacher education. Owing to a pre-service teacher education project supported by the Counsel of Higher Education (CHE) / World Bank collaboration, educational faculties were restructured in 1998-1999 academic year. These new restructure included following changes,

- New academic departments which aim to train second step elementary school teachers were opened,
- Collaboration between science faculty and educational faculty were established to educate teacher candidates on science,
- Non-Thesis Master's Programs was offered to educate more qualified teachers
    - The Programs will be organized for students holding a bachelor's degree in subjects to be determined by the Council of Higher Education with the aim of training specialist area teachers for secondary schools (CHE, 1997).
- A communication net among universities, MNE and thus practice schools was established,
- Teacher pedagogical courses were rearranged,
- New prospective academicians were sent abroad to meet the need of the educational faculties,
- Infrastructure and source of educational faculties was improved,

- Accreditation studies of educational faculties have been started.

New restructure has been made some positive contributions to Turkish pre-service teacher education (Baskan, 2001). However, there were following problems (Unsal, H. 2001; Algur, 2002, Gullac, 2003 cited in Aksu, 2005; Ayas, 2005; Simsek 2005),

- Pedagogical courses (formasyon dersleri) were written as italic in the restructuring. However the responsible field from the courses was not explicitly determined. This caused a chaos between educational science and field experts.
- Different application of following issues has been in the universities
    - Teacher certificate program,
    - Undergraduate programs,
    - Master of Science with 3.5 +1.5 duration,
    - Non-Thesis Master's Programs.
- Expected collaboration between Faculty of Art and Science and Faculty of Education was not established.
- Insufficient infrastructure for new restructure such as academics, physical capacity, financial factors.
- Accreditation of educational faculties wasn't completed.

A new study to overcome the problems of the restructure in 1997 was approved by Council of Higher Education and its working started to be able to make new updates in the program. So, 25 academicians from different educational faculties and two MNE authorizes composed a working group. This group prepared a new teacher training blueprint in March 5-11, 2006. This teacher education program got the last version owing the opinions of other academicians. At last, in July 21, 2006 it was promulgated by the CHE. Two basic renewals in teacher education program are as follows (CHE, 2006)

- The new program rationally should include 50-60% field knowledge and skills, 25-30% teaching profession knowledge and skills and 15-20% general knowledge.
- Teacher candidates should have an opportunity of getting practice in combined classrooms, rural areas and Regional Basic Education Boarding Schools (YIBO).

The recent teacher training projects in Turkey

In 2004, the MNE accepted more constructivist based curriculum for elementary education. After one year pilot in some schools in the different regions of the Turkey, all teachers in the country began to use this new curriculum. In May 14, 2005, faculty of education in Anadolu University sent an invitation to 25 professors who studied on curriculum and instruction to participate a meeting to evaluate this new curriculum. This comitee determined one of the problems of this new curriculum "lack of suffecient teacher training before initiating new curriculum"(CIC, 2005, p.8). This report said that without knowing how to apply methods, techniques and principles of new curriculum, teachers were expected to use it in their classes. Indeed, The MNE had conducted several workshops and created a portal for teachers sharing their materials. Setting a portal showed that the ministry had noticed the importance of technology use in this change process. The portal's engine code was developed PHP-Nuke and mainly aims to publish example activities, lesson plans, information about new curriculum, announcement, etc (http://ttkb.meb.gov.tr/ogretmen/). This environment had 23.972.778 visit from October, 8, 2004 to May, 6, 2007. This result showed that how much teachers were interested in this environment. However, there have some limitations of the portal. In the first days, although this portal had a forum environment which members could interact with each other, today, the ministry removed this component of the portal. In addition, in the first days, members could send the portal moderator to publish their example lesson materials on the portal. However, today, it does not have any tool which will provide a communication net among visitors. Its visitors can only download files which are developed by the ministry workers. Secondly, its infrastructure was not very well since it was hacked several times and locked because of majority of synchronous visitors who try to access to the web site.

In addition to endeavors of the MNE to support teachers on new curriculum, another notable teacher training project "L-Test", which was supported by The Scientific and Technological Research Council of Turkey aimed to design video-cases to provide both preservice teachers and inservice teachers support and additional knowledge, skills, and attitudes necessary for successful teaching (Olkun, Altun & Deryakulu, 2006; Olkun &Altun, 2007). This project lets teachers pedagogical support to make new curriculum more understandable, adoptable and finally usable. The video cases are supposed to fulfill following functions: 1) demonstrate different age children's exemplary problem solving strategies, 2) foster teachers' awareness of different age children's mathematical thinking levels, 3) encourage reflection on student-centered approach to teaching mathematics, 4) support the design of proper mathematics teaching-learning activities for different age

children. The project team proposed to use these video cases by a multimedia CD or into the Internet environment as digital videos.

Finally, when a teacher searches on the Google Turkey, s/he will find lots of site related to her/his profession. Most of these oCoP environments were created owing to individual efforts. Two of them which has a historical heritage and mostly known are Compass of Teachers (Öğretmenin Pusulası- http://www.ogretmeninpusulasi.net/), The Site of Teachers (öğretmenler sitesi- http://ogretmenlersitesi.com/).

In sum, history of teacher education in Turkey and new changes in educational system showed that teacher education needed to more technology based solutions. In this context, the most powerful way seems to use oCoP environments in teacher education. Similarly, Cagiltay, et al (2001) proposed the use of virtual communities facilities in which teachers share their experiences and practices with other teachers to provide lifelong learning opportunities. There are very limited attempts to compose oCoP environments. Therefore, this PhD study will contribute this part of literature in Turkey.

CHAPTER 3

RESEARCH METHODOLOGY

This chapter presents detailed description of the research methodology which was employed in the research study. Research questions, selected research methodology with the type of qualitative tradition, overall research design (three main phases of the study), sampling, data collection methods, process of data analysis, researcher's role, trustworthiness and limitations and delimitations of the study will be presented.

3.1. Research questions

The main aim of the research is to reveal dynamics of two connected research designs which requires both mandatory participation and then voluntary participation of the same preservice teachers by investigating preservice teachers' experiences and their perceived opinions. So, the main research question with sub questions is,

The main research question:

What are the dynamics of two online communities of practice in pre-service teacher education?

Sub questions:

- How do preservice teachers evaluate two environments?
- How do preservice teachers behave in two environments?
- What are the critical factors influencing amount and quality of discussions?

3.2. Selected research methodology: Qualitative research

There are different types of knowing in the world. We use sensory experience, agreement with others, expert opinion or logic to obtain data from the world. Apart from these methods, the scientific research studies provide researchers to obtain accurate and reliable information from their environments (Fraenkel & Wallen, 2000). Therefore, in order to explore unknowns, using scientific research methodologies is a must for all researchers.

Scientific research studies can be defined by combining Instructional Technology definition of AECT (1994) as a systematic and disciplined endeavor to produce knowledge about "theory and practice of design, development, utilization, management and evaluation of processes and resources of learning"(Seels & Richey, 1994. p.1). Furthermore, scientific research studies have some special characteristics. The first one is *Objectivity* which supports that a research study should be unbiased and open minded. *Precision* is another characteristic that means a research is structured process accuracy. Another is *verification* that means the results can be confirmed or revised in subsequent research generalization. The fourth characteristic is *empiricism*. That is, results of a study are based on certain data. A research should be guided by evidence obtained from systematic research methods rather than opinions. *Logical reasoning* is fifth characteristics of scientific research that means you should use one of deductive and inductive reasoning to draw a conclusion. The last characteristic is *probabilistic thinking*. To it, results of a research study may not absolute. Social science does not offer certainty.

In the past, research studies on instructional technology were mainly held by quantitative approach while today descriptive and qualitative approaches have been getting more popularity. This is not a temporary fashion in social fields. Rather, it is result of a paradigm change (Yıldırım & Şimşek, 2004). While previous research methodologies which were employed in IT research studies were experimental, the complexity of new technologies and learning process and unexplored nature of new phenomenon direct researchers to use qualitative methodology in their research studies. (Savenye & Robinson 2003; Knupfer, & McLellan, 1996). Further, famous Clark & Kozma debate also propose the use of qualitative research methodologies to understand the effect of media on learning (Clark, 1983, 1994a, 1994b, 2001; Kozma, 1991, 1994).

The purpose of this study requires in-depth analysis of the community building efforts and experiences of pre-service teachers in an online learning environment. Therefore, during the research study, the researcher aimed to present detailed picture of the phenomenon based on the research questions. So, mainly qualitative research methodology was employed. Barab, MaKinster and Scheckler (2004), while focusing on challenges in the

development of a web supported community of practice, described the advantage of qualitative research as "…makes a commitment to analytical framework that provides a useful lens through which the data can be interpreted" (p.57). To them, other researchers and designers are to use a well documented literature to compose a base for their researches or jobs. It can be seen in the literature, qualitative research methodology has also been used to investigate this phenomenon in some doctoral studies similar to this one (Baek, 2002; Moore, 2003).

Taken into consideration of the basic characteristics of the qualitative research studies in the literature (Bogdan & Biglen 1998; Goetz & Lecompte, 1984), Yıldırım and Şimşek (2004) determined its six characteristics: naturalistic environment, the researchers' participatory role, inductive approach, exhibition of perceptions, flexibility of research design and qualitative data. This study having all characteristics of qualitative research is diverse from quantitative approach. At first, this study is naturalistic. The participants made no role. All cases occurred in a natural environment in their own context. Design of mandatory participation term is a part of overall context since the aim is to investigate dynamics of this term. Secondly, the researcher was one of the data collection tools. She spent time in the field, interviewed directly with the participants, and also experienced the experiences of the participants. Furthermore, she also used data which were obtained owing to her experience and perspectives in the field, in the analysis. Thirdly, in this study, it was important to present how each variable were related to each other. Therefore, all variables of the study were investigated to reach a whole picture of the phenomenon and the whole picture was concluded according to the context. The whole picture is the aim of this research. Fourth, during the research, the researcher tried to present the participants 'perceptions and experiences which is one of the most important aims of qualitative research studies. Fifth, different data collection methods were viewed in this study such as interviews, observations, and document analysis. The researcher tried to control trustworthiness of the research. Sixth, this research aims to present a descriptive picture of the environment to the reader. Although some quantitative data were collected it was not the main instrument to reach a unique result.

Case study

As can be understood from the nature of the study, this research study is based on mainly case study approach, which is one of qualitative traditions. Yin (1994) defines case study,

> "…A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident (p.13)

Merriam (1998) defines a case "people such as a student, a teacher, a principle or groups such as a school, a community". In addition she stated that "if a phenomenon you are interested in studying is not intrinsically bounded, it is not a case" (p.27). In this study, there is a limit to the number of people to whom data collected from and the data collection duration also determined by the researcher. That is to say that this study is bounded enough to qualify as a case study.

This study is characterized as a case study because its nature has all characteristics which case studies have. First, the study is problem centered and small scale as much as possible. It focuses on the dynamics of a particular learning community of preservice teachers. Pre-service teachers who participated in the online environment were a determined group which the researcher wanted to study on. Second, this study took an appropriate time interval to collect data from the field and the results of the study were presented in a descriptive way. The researcher tried to illustrate one fact but many factors contributed to it. Third, the researcher tried to illuminate the reader's understanding of using online communities in teacher education. At the end of 10 months reflection reports, documents and interviews helped the researcher to understand the dynamics of the environments in pre-service teacher education. That is, the researcher collected data from a wide variety of sources.

3.3. Activity theory as an analytical tool and a design framework

The tenets of the activity theory informed the researcher's interpretations through the research study. Especially, the conclusion part of the thesis focuses on the core components of the activity system. That is, using activity theory as a theoretical lens, the researcher examined the relationship between preservice teachers and object in terms of their mandatory and voluntary participation which are two tensions of this study. Components of activity theory have been helpful for the researcher to analyze these two activity system since they are mediators for preservice teachers to accomplish the objects. These components are, a) tools, b) rules, c) community, and d) division of labor. In the following paragraph, activity theory as a design framework has been used to summarize all design process and main components to be able to take the reader's attention the relationship between the activity theory and design issues.

The simple activity system, which was stated by Leont'ev, Vygotski, Luria and Marx, composes from subject, tools and object (showed in Figure 3.1 in the first circle). The relationship between subject and object is mediated by tools. In the design framework of this

study, the researcher is the unique subject who influenced the construction of the PDC which is an electronic portal having asynchronous communication tools since this study is an individual effort. The main components of this portal are supported by various tools such as the METU' s Scientific Research Project Foundation (SRPF), related literature, a pilot study, good examples, a private software company's e-learning portal and computer software, etc. In addition to the tools, in the large activity system, the researcher reached the object owing to rules, community and division of labor. The rules are based message design principles. Design rules which were used in this system are tentative rules some of which the researcher had not a chance of testing since this project has been the first experience of the researcher. Community composes from other designers, other PhD students and Math teachers. First of all, the researcher is in the community of PhD students. Owing to discussing with others, they had some cues about design issues. For example, she does not know how to create a digital video but she learned owing to other peers. Furthermore, designers and software developers helped the researcher learn how to mediate her blueprint with their e-learning portal. Finally, inservice teachers who were recorded or with whom the researcher meet in schools while she was recording videos gave some cues about the content of the portal and motivated the researcher about the design of this kind of environments. In this activity system, division of labor is between private software company's programmers and the researcher. The researcher supported the participants in whole research process while the programmers solved serious technical problems in the portal. Out of this division of labor all process is pertained to the researcher. In the following parts, this summarized design issues will be presented according to the order of when the researcher experienced design principles of the study.

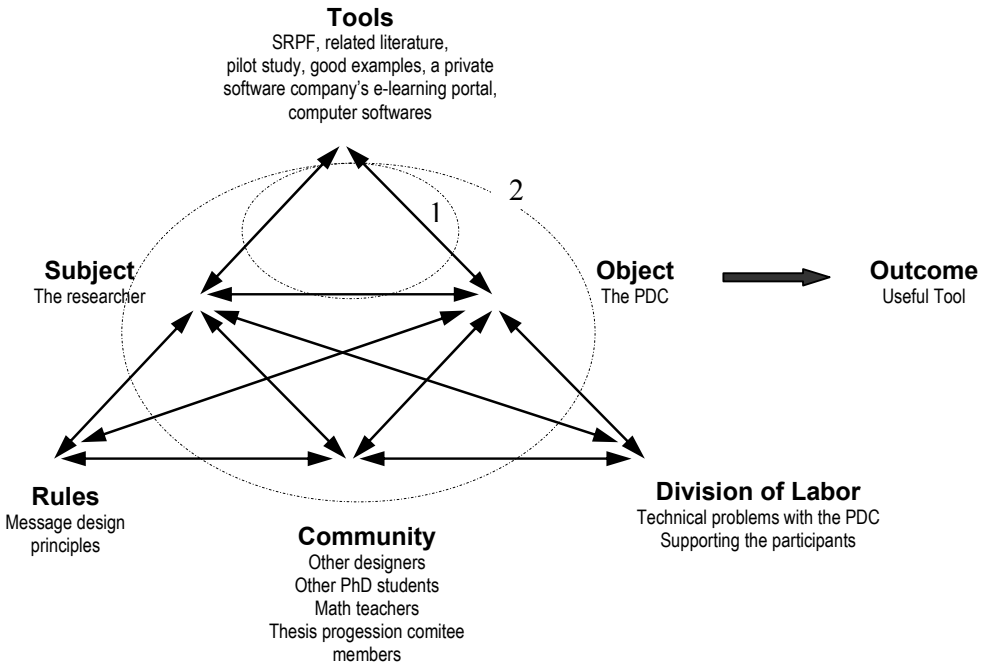


Figure 3.1 The activity system of the design of the PDC.

3.4. Research design: 3 main phases

In qualitative research studies, fieldwork can be defined as "the ways most qualitative researchers collect data" (Bogdan & Biklen, 1998). The research design of the study was composed of three main phases (Figure 3.2). The first phase included the design of the virtual environment. It encompassed the determination of design decisions and the design and development processes of online environment. This phase took six months.

The other phases are mandatory participation phase and voluntary participation phase. These phases can be thought as two different but connected cases. According to Yin's (1994) classification, holistic multiple case design is appropriate for this research design. At the beginning, the main research design of this study included only phase 2 but later the data were also collected for the phase 3. So, the phase 3 was added to the scope of this research study as an extension of phase 2. In other words, there were two independent but connected cases. Each of them was investigated independently and then they compared with each other. The most important issue was that the researcher aimed to investigate the similar things in these two environments in their own context.

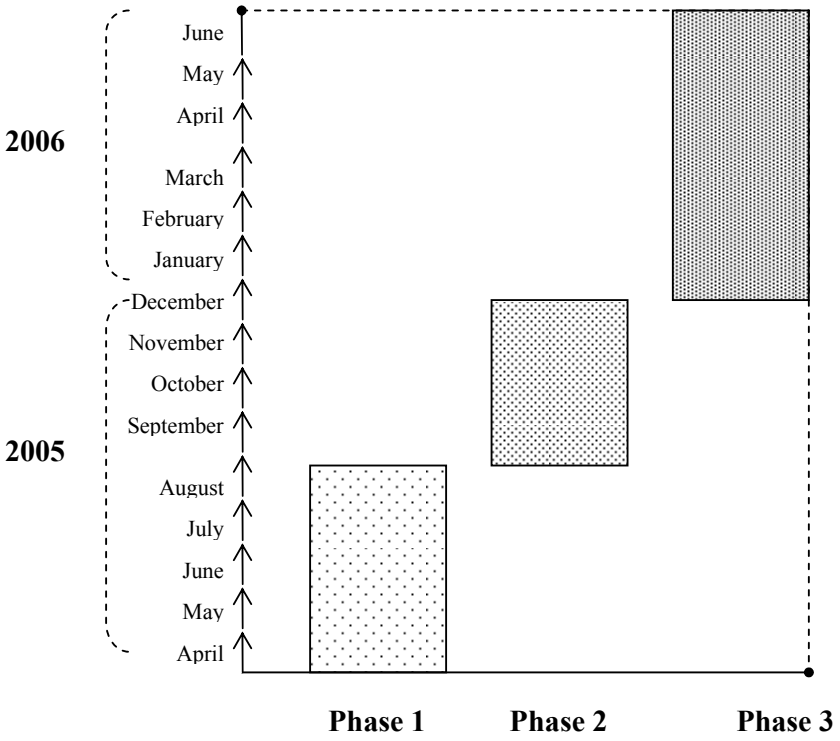


Figure 3.2 Three main phases of the study.

In phase 2, pre-service teachers from three different universities participated in the online environment as a part of course requirements. This phase took 12 weeks. Then, Phase 3, composed of the Phase 2's preservice teachers, inservice teachers and academicians. In this phase contribution was voluntary contrary to previous phase's mandatory participation. This last phase took five months. Data obtained from the phase 2 and 3 composed of the results of the study. Details of phase 1 and research design of phases 2 and 3 presented in the following section.

3.5. PHASE 1. Design of the online environment

As mentioned before, the researcher completed the design of online environment in six months. This duration included a period of examination of the literature, a pilot study, and developing of the environment. In this part, the design decisions and the components of online environment are presented.

3.5.1. Design decisions

Design of the virtual environment was made according to the results of a) analysis of existent online communities for teachers and related literature and b) a research study on teachers' demands from online learning environments and professional development.

a) Analysis of existent online communities for teachers and related literature

In the last decade, the number of web sites has increased exponentially owing to technologic developments and some of them have been inhabited by people coming together to manage professional knowledge such as programming, teaching, medical, etc. Teachers in Turkey and abroad have also created web sites to meet their needs. In addition to individual attempts, professional organizations have also developed online teacher communities. There are lots of online communities[1], e.g. TappedIn, Inquiry Learning Forum and Ogretmenler sitesi. At the beginning of the study, these communities were examined and mostly used attributes of them were noted to be used in this research. TappedIn and Inquiry Learning Forum were products of project based group works. TappedIn members participate synchronous discussions about determined discussion topics which are announced by e-mail. The most attractive characteristic of the Inquiry Learning Forum is providing an opportunity of observing real classroom environments for mathematics and science teachers. Except for TappedIn, the other platforms have a forum environment. Ogretmenler sitesi is an individual attempt from Turkey. It can be thought as a rich library which includes everything such as lesson activities, lesson plans, and announcements from Ministry of National Education for teachers.

After examination of existing learning communities for teacher education, the researcher investigated the literature to understand hot topics in teacher education. Wang and Hartly (2003) reviewed 20 studies from ERIC to reveal the relationship between video technologies and teacher education reform. This review suggests that video technologies should be widely used to support the transformation of preservice teachers' conceptions of teaching and learning. In addition, it was used as a tool to help preservice teachers to acquire pedagogical content knowledge and develop their pedagogical understandings of diverse learners. In addition, there were lots of positive evidence to use video in teacher education (Hewitt, Pedretti, Bencze, Vaillancourt & Yoon, 2003; Knight, Pedersen & Peters, 2004; Sherin & van Es, 2005).

[1] -Tapped in website: tappedin.org
-Inquiry Learning Forum web site http://ilf.crlt.indiana.edu/
-Öğretmenler sitesi web site http://ogretmenler.com

As a result of the analysis, the researcher decided that prospective environment would include a library section, real classroom videos related to the new curriculum and a forum section. Furthermore, this environment should allow asynchronous communication.

In the beginning, the researcher tried to develop the platform by herself. However, this process was very problematic. Although she wanted to develop a professional environment, her technical skills were not sufficient. Furthermore, the PhD thesis had gotten a very limited monetary support from Graduate School of Natural and Applied Sciences in METU. So, she communicated the director of an educational software company. The researcher made several meetings with the director and programmers about what she expects from them. In this process, the company began to develop an e-learning platform and designed a simple learning module for inservice teachers. They proposed to use this platform for the study. Furthermore, they wanted to learn the lacks of their e-learning system. So, a pilot study for both for PhD thesis and the company were designed. In the following title, the effect of this study on this PhD thesis is presented.

b) A prior research study on teachers' demands from online learning environments and professional development (Baran & Cagiltay, 2006):

The pilot study was conducted in December, 2004. In the study, the researcher used Halsoft e-learning platform which was developed by Halıcı Yazılım software company. Therefore, results of the study were important since it directed the design decisions of the online environment for the study. It was designed to find answers of two main research questions:

- What are in-service teachers' experiences in traditional professional development environment?
- What are in-service teachers' experiences in online professional development environment?

10 teachers registered in a training course for four weeks. Experiences of teachers were evaluated by focus group and individual interviews. The content was prepared by a professor from the Department of Educational Sciences in METU. It was about learning theories. The learning module has voice, pictures, and animations to support to the content.

According to the results, the participant teachers reported main problems of traditional professional development program as unattractive and less familiar topics, forced to participate in PD programs, courses given by academicians who do not have any school

experience, and the absence of practical knowledge. Furthermore, teachers determined their needs as practical knowledge and different materials with various teaching methodologies in their own fields.

Similar to expectations from traditional PD courses, for online PD courses the teachers especially emphasized the importance of practical knowledge. Therefore, we may conclude that the type of learning environment, online or face to face, for teachers, is not much important. The key point is that teachers expect to get applied or practical knowledge. Furthermore, when the opinions on PD course selection were asked they want to participate in the practical courses. They preferred material development and classroom management course rather than theoretical based courses.

The teachers preferred traditional learning environment rather than online. However, only if their expectations are satisfied they would desire online courses. Specifically, their expectations are interactivity, practical knowledge, and solutions for their daily life problem. The teachers also proposed that online courses should be organized according to teachers' fields and the courses should include daily life experience, tips and clues from other teachers, new approaches, novel things, projects, presentations, videos, and pictures.

Further, another finding was that teachers wanted to get professional development (PD) in homogeneous groups. That is, a mathematics teacher should have participated in a course with math teachers. So, teachers could produce knowledge more related to their own field because they wanted to learn other mathematics teachers' experiences.

In sum, feedback obtained from the results of the study generally matched with attributes of available online teacher communities. The important topics obtained were that virtual learning environment would present teachers more practical knowledge and this environment would be classified according to teachers' teaching branch. Furthermore, interactivity is also an important topic for the online environments. Teachers want to communicate with their peers. Therefore, the researcher paid attention to all these factors in the design and development of the PD environment.

After this pilot study, the researcher prepared a blueprint to the director of the company. There were some problems between the researcher' demands and the companies' e-learning platform. After meeting with their programmers and the director, the researcher modified the learning environment according to their e-learning platform. That is to say that the researcher could not achieve her every request. The final product of the online environment is presented in the following headings.

3.5.2. Online environment

The Professional Development Circle (in Turkish, Mesleki Gelişim Çemberi) is a web based learning environment created for K-12 mathematics teachers, teacher candidates and academicians who want to work together, to share their knowledge and to improve their teaching skills. The PDC is designed especially for people interested in mathematics education. According to Riel and Polin's (2004) classification, the nature of a learning community changes depending on how it is used. The PDC can be used as a task based learning community, knowledge based learning community and practice based learning community. With the aim of task based learning community, Turkish mathematics educators can use it to support their school practice course. The instructor gave a task to the students and the aim of the students was to accomplish this task at the end of the term. With the aim of knowledge base community, a moderator (a teacher or an educator) compose a knowledge based for their course. They can upload their materials to the portal. That is, over the years, it can be a resourceful knowledge base for the users.

The PDC has a way of being practice based learning community. The PDC took attention of teachers in practice. It has 402 members, at the end of 2006. Teachers have contributed the environment voluntarily. There were monthly discussions in the PDC through an electronic list. Discussion topics were selected among hot topics in mathematics education. Within the PDC, participants can obtain or share their lesson plans, watch video examples of expert or novel teachers discuss about them, engage in online discussions and communicate with other members through the electronic list.

The main elements of virtual environment were determined into design decisions part. As it can be seen from Figure 3.3 the system have a main menu including "library", "my videos", "communication", "my profile" and "forum" links. It is expected that these parts of the online environment supports the user's professional knowledge. Library part is an opportunity to access rich tacit knowledge source developed by different teacher perspectives. Since "my videos" part provides teachers to view other teachers' classrooms, it plays an important role in the development of professional knowledge. They can capture the positive and negative events in the classroom without a necessity of attending real classes in schools. Communication is a theme that demanded by teachers themselves. This part provides an opportunity to a teacher to communicate with other peers and to discuss the others' classroom practice. More detailed explanation of these parts is mentioned in following subheadings.

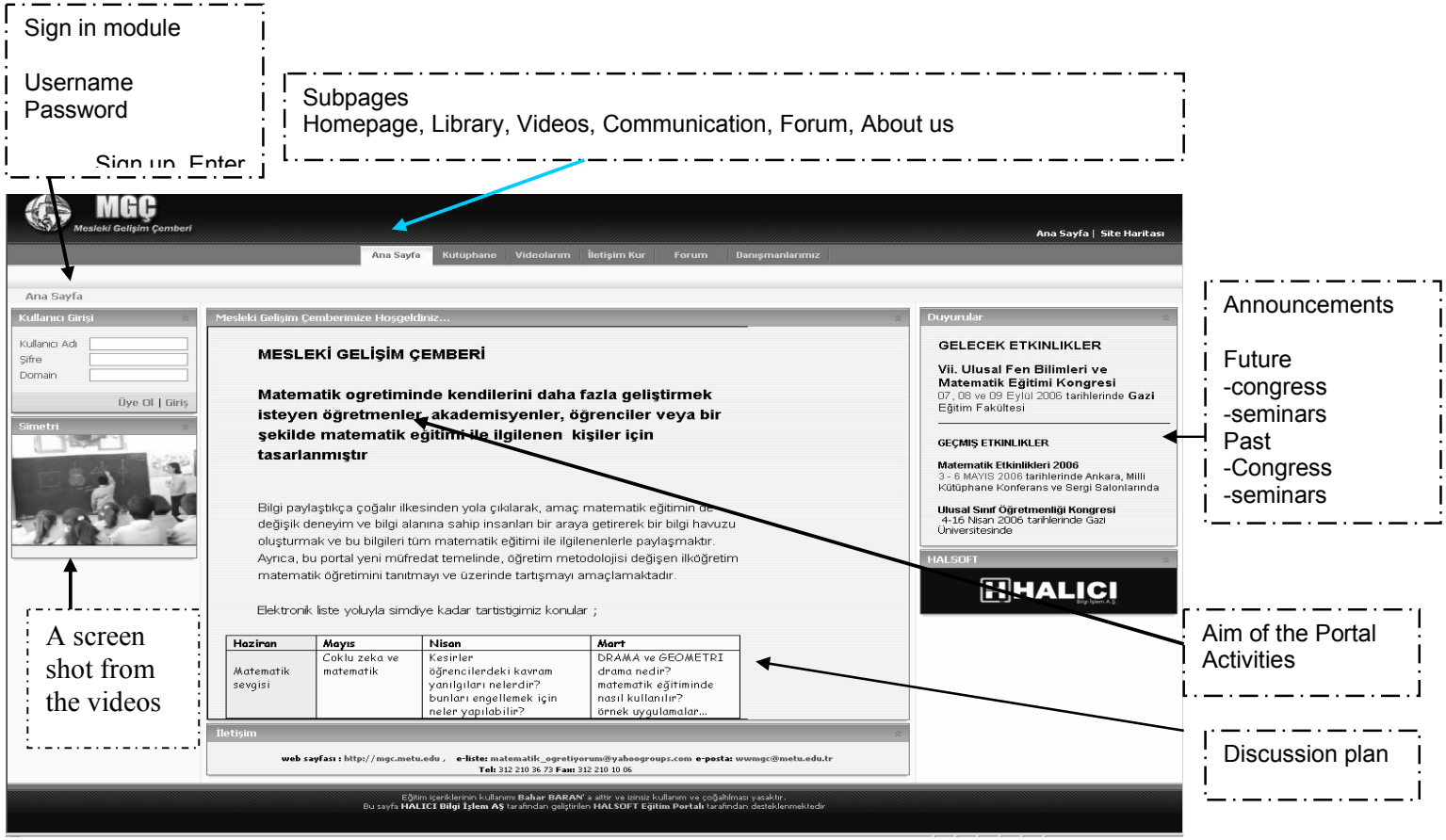


Figure 3.3 The main screen of the PDC

Library

Library section of the portal includes materials related to mathematics education. The screenshot of the library can be seen in Figure 3.4. Library includes activities related to new Turkish mathematics curriculum, academic papers, electronic materials, mathematics software. By the end of 2006, there were totally 258 materials which were sent by academicians, teachers and other participants (Table 3.1).

Figure 3.4 The library part of the PDC.

Table 3.1

Contents of the Library in the PDC portal.

Titles	**Subtitles**		**Counts**
New mathematics curriculum	Curriculum		6
	Related articles		25
Academic publication			1
Computer aided materials	Excel		48
	Power point		3
Mathematic software			19
Lesson plan	first grade	Lesson plan	15
		Activities	21
	second grade		2
	third grade		1
	fourth grade		17
	fifth grade		28
	sixth grade		14
		In English	17
	seventh grade		15
		In English	6
	eighth grade		2
Coming from academicians			8
Other field			2
Added by you			7
Coming from discussion list			1
		Total	258

My videos (videolarım)

Design of "My videos" part of the portal took long time engagement in schools and studying on digital videos. After real classroom videos were recorded, they were converted into digital version and added into the "My Videos" part. In the following headings, this process will be mentioned.

Digital video creation process

Recording video from real classroom environments requires permission from the Ministry of National Education. In 2005 spring term, required permission to shoot videos at two schools from Ankara was granted (Appendix A). After permission was gotten, the researcher followed 13 steps before recording videos.

1. Going to schools,
2. Meeting with their principles and teachers,
3. Learning which grade teachers instruct,
4. Meeting with children,
5. Discussing with teachers on which topic is appropriate for their classroom and deciding on the topic,
6. After leaving from the schools, searching activities on the Internet or books,
7. Going to the schools,
8. Discussing activities with the teachers and coming to an agreement with teachers,
9. Deciding videotaping day
10. Attending classroom with the teacher to make children familiar with the researcher,
11. Being ready at the first class in the videotaping day so that children become familiar with the camera.
12. Making a test record to make children to become familiar with the researcher,
13. Recording classroom dynamics in second or following classes while the teacher is applying activity.

The researcher faced with some problems to shoot videos. At first, in the schools, teachers did not want to be recorded even if the required permission was gotten from the

Ministry of Education and the principal asked them to help the researcher. They hesitated although the researcher explained them the aim of the study. They asked whether or not the researcher is an inspector, whether or not the researcher will use recorded videos for different aims or they asked nothing and only said "No. I do not want." without any explanation. Second problem were related to recording real classroom dynamics. Not only video teacher but also children acted naturally during the recording process. That is, there was not a determined scenario to follow. So, the researcher could not estimate the points where teachers or children moved and thus video recorder sometimes could not catch their movements.

In total, 10 videos were recorded in the schools (Table 3.2). The first two videos were recorded from School-A, following two videos were recorded from School-B. Last six videos were also recorded in School-A, whereas teachers of them were fourth grade undergraduate preservice teachers from University X. That is, teachers in the videos were both undergraduates and expert teachers. This decision was made intentionally so that rich classroom dynamics came out. In Figure 3.5, teacher candidates were preparing material for their lesson. Recording date and topics of the videos and student grade levels were presented in the Table 3.2.

Figure 3.5 Teacher candidates before recording.

After the videos were recorded, they were processed. The researcher used Windows Movie Maker to process the videos. Maximum length of each video was approximately 20 minutes although a lesson takes 40 minutes in elementary schools. There were two reasons of processing entire lesson in a smaller part. First one was related to recording process. During the recordings the lesson might be interrupted by several reasons. Processing the videos provided an opportunity of omitting these interruptions. Second aim was related to target population who would watch the videos. It was supposed that short

videos including all dynamics of the classroom would let the viewers put more attention to the videos. Furthermore, the videos were also divided into meaningful parts. Generally each video had an introduction, main topic and closing parts of the lesson. Finally, the researcher used Windows Media Encoder to convert the videos to the Internet videos with three main Internet speeds, 28Kbit, 128Kbit and 256Kbit.

Table 3.2

The videos.

No	Date	**Name**	**School**	**Topic**	**Level**
1	01.03.05	Mukaddes	School A	Geometry	third grade
2	01.03.05	Zehra	School A	Division	second grade
3	03.05.05	Ahmet	School B	Subtraction	first grade
4	03.05.05	Sibel	School B	Geometry	second grade
5	13.05.05	Demet	University A	Symmetry	Fifth grade
6	13.05.05	Arzu	University A	Geometry	fifth grade
7	13.05.05	Dilek	University A	Measurement of area	fourth grade
8	26.05.05	Adile	University A	Probability	fourth grade
9	26.05.05	Ebru	University A	Geometric figures	fourth grade
10	26.05.05	Tuğba	University A	Measuring	fifth grade

"**My videos" part of the portal**

The PDC has 10 videos. In order to watch the videos it is required to register to the web site. After the administrator of the portal allows a user's video request the video was added the user's "My Videos" page. A screenshot from "My videos" can be seen in Figure 3.6 Main video screen shows all videos when a user logs in. Users should click on "start (başlat)" button which is placed in the name of the video to open video screen. Each video has a start button.

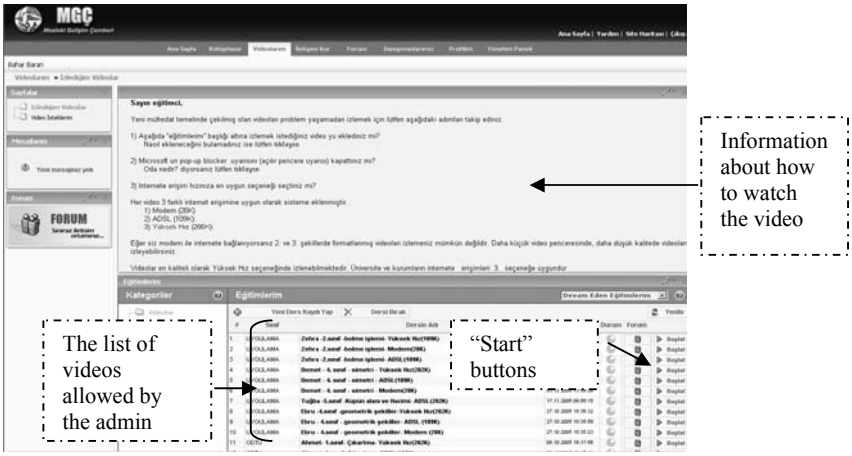


Figure 3.6 The main video screen.

When users click on the start button, sub video screen is opened automatically in full screen mode (Figure 3.7 -a). Users have a chance of getting detailed information on videos in this screen. To watch a video, the user should click on start button. So, the last screen is opened (Figure 3. 7-b). This screen has three main frames. Left frame includes the parts of the videos with their duration. So, users have the flexibility of selecting parts (introduction, process or closing) of the video which they want to watch. Users can view the video in the right frame. This frame also includes a link to lesson plan of the video and duration information about the video. Furthermore, if a user's computer does not have windows media player which is required to play the videos, in this frame he/she can find information about how to download this software.

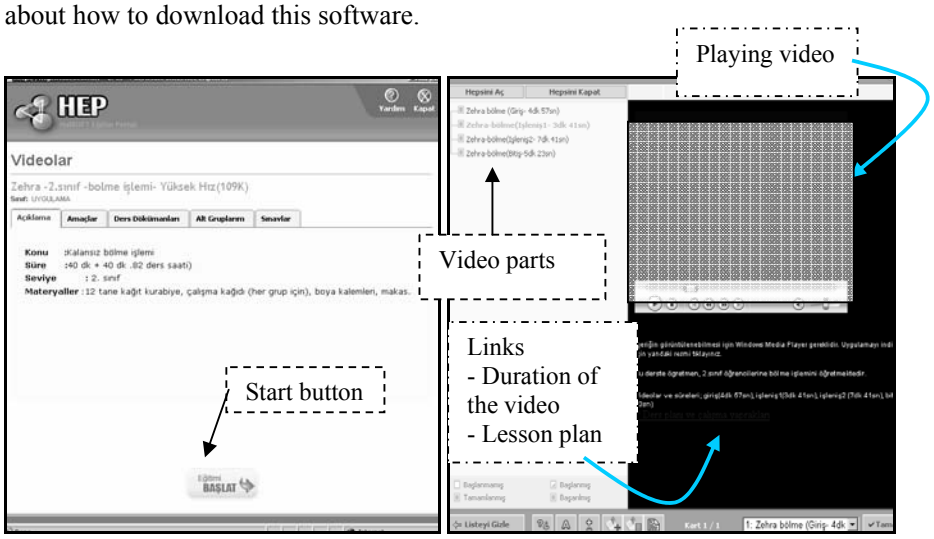


Figure 3.7 The subpages of the video screen.

a. A screenshot after clicking "start" button on the figure 3.6,
b. A screenshot after clicking "start" button on the figure 3.7-a.

Communication

This section of the PDC allows users to communicate with each other. A screenshot of this section is seen in the Figure 3.8. Incoming messages are collected in “my messages” module. When users want to read messages, they click on “read message” button. Further, they can see information about the date of the messages and who sent it. If they want to write a message, they click on “write a message”. So, a new screen is opened. This new screen has two frames. Upper frame is to post a message while in lower frame users may select members that they want to send a message (Figure 3.8).

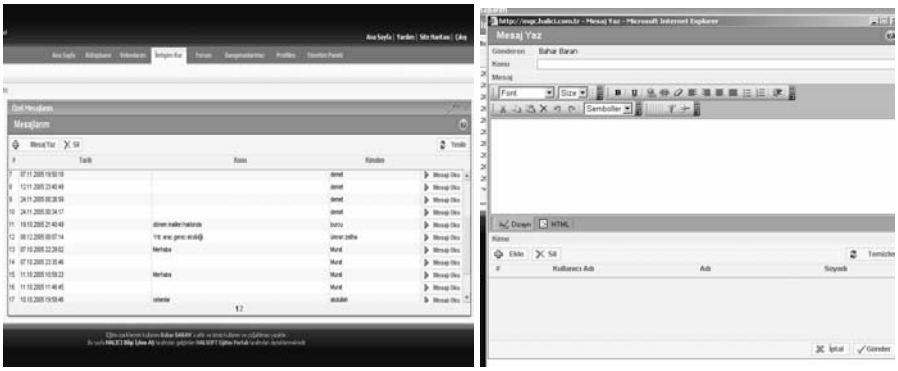


Figure 3.8 The communication part and its subpage.

Forum

A screen shot from the forum can be seen in Figure 3.9. Users access forum page from the link in this page. Main forum page includes interesting topic titles to be discussed by the users. Each forum heading collect information about the number of sub titles placed under this heading and the number of messages submitted under this heading. Users can read messages by clicking related heading.

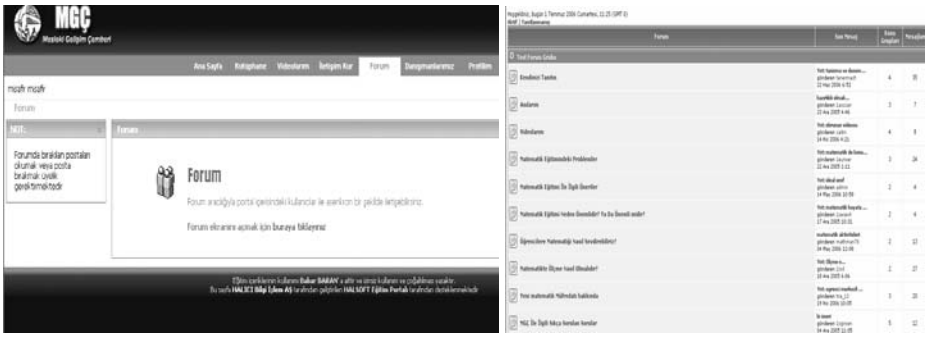


Figure 3.9 Forum part and its subpage.

My profile

Users can change their information through this page. A screen shot from this page can be seen in Figure 3.10.

Figure 3.10 A screenshot from "My Profile" in the PDC portal.

Discussion list used in the study

The address of the electronic discussion list used in the study is matematikogretiyorum@yahoogroups.com. A screenshot from the discussion list main page can be seen from the Appendix A. Yahoogroups was selected since its group page provides lots of opportunities to its users. A yahoo user can access to the history of the electronic discussions and download files which added by the administrators, rating polls, access links, etc. Furthermore, nonmembers can find this discussion list from the group page and easily sign up to this group (Figure 3.11).

Figure 3.11 A screenshot of discussion list main page.

3.6. PHASE 2. Mandatory participation

The second phase of the study included a research design for preservice teachers in a mandatory participation environment. The aim of this phase was to understand the dynamics of online learning environments when there is a structured setting. To achieve this aim, a course design was used for the students of three universities (Table 3.3). These universities were the Middle East Technical University (METU), Canakkale 18 Mart University

(COMU) and Ankara University (AU). In the fall semester of 2005-2006 academic year, the PDC was integrated to "School Practice II" and "Mathematic Teaching" courses. The participants were graded based on their participation which would affect their overall grade at the end of the term.

At the beginning of the term, two face to face meetings were arranged to inform the participants about the PDC activities. Therefore, COMU students were invited to Ankara since the other two universities are located in Ankara. They participated to the courses in AU and METU. In these meetings, the researcher made a presentation about how the participants will use the PDC and informed them what their responsibilities are. Further, the participants' questions were answered and the PDC outline as a guide was distributed to the participants (Appendix D). This outline includes detailed information about the PDC activities, the participants' responsibilities and tips about the activities. The aim of this face to face meeting was icebreaking among the participants. Out of meetings, the COMU participants made sightseeing, too. The participants of different universities were very uncompanionable to each other. One day meeting was not sufficient for icebreaking. Moreover, earphones as a gift were distributed to them since the computer laboratories did not have any speaker attached to computers. Lastly, computer laboratory hours were arranged at each university.

This stage divided into five periods from October 5th to December 18th. The PDC was not active because of Ramadan Bayram from October 31st to November 6th. The first period took only one week. In the first week, the responsibility of the participants was to send introductory e-mails including information about themselves to the discussion list (matematik_ogretiyorum@yahoogroups.com). Only the second period took three weeks while the others' took two weeks. Duration of the second period was longer than the others' since this period was a preparation stage. The researcher expected that at the beginning of the term every student will become familiar with the use of the discussion list and the portal without any problem. These periods were related to watch a video on the portal and to discuss on them with other pre-service teachers.

Every period pursued following process; one of the universities started the discussion; second university students added their comments and third university wrote a lesson plan in the light of comments. In every period, the responsibility of the universities changed so that every university had a chance of doing each activity as can be seen in Table 3.3. For example, in the second period METU students had to send first comments about the video while in the next period they had to reply to the comments of others and finally in the fourth period they had to submit a new lesson plan to the discussion list. It was a curricular process. Every student was responsible to send minimum three comments to the discussion

list per period. That is every student has to send at least 12 e-mails in total. The participants were exempted to send e-mail to the discussion list if her/his responsibility was to write a Lesson Plan.

Table 3.3

Discussion periods of the mandatory participation term

PERIODS	ACTIVITIES
Period 1. 05 - 09 October	**Meeting** • Registering students to discussion list and portal • The participants sent first e-mail to the discussion list • Content of the first e-mail should include o Name/last name o University and department o Reasons of selection the department as a profession o Their aim after graduation o Their interests o A digital picture
Period 2. 10 - 16 October - METU 17 - 23 October - COMU 24 - 30 October – AU	**Ahmet's Video (Subtraction)** Comments on the activities in video. METU Reply to comments: COMU A lesson plan proposal by the synthesis of discussion: AU
31 October - 06 November --Holiday-Ramadan Bayram	
Period 3. 08 -15 November - AU&METU 16 - 20 November - COMU	**Ebru's video (Geometric Figures)** Comments on the activites in video. AU Reply to comments: METU A lesson plan proposal by the synthesis of discussion: COMU
Period 4. 21 - 29 November-COMU & AU 30 Nov - 04 December – METU	**Tugba's video (Cube)** Comments on the activities in video. COMU Reply to comments: AU A lesson plan proposal by the synthesis of discussion: METU
Period 5. 05 -13 December- METU & COMU 14 - 18 December – AU	**Demet's video (Symmetry)** Comments on the activities in video. METU Reply to comments: COMU A lesson plan proposal by the synthesis of discussion: AU

For this stage, selected four out of 10 videos were Ahmet's video on subtraction (17.34 minutes), Ebru's video on geometric figures (26.66 minutes), Tugba's video on cube (21.32 minutes) and Demet's video on symmetry (21.56 minutes). The participants watched totally 81.94 minutes of video and mean video duration was 21.72 minutes (Table 3.4) Lesson plans of these videos can be found in Appendix E.

Table 3.4

Selected videos

No	Name	Topic	Student level	Parts	Durations (minutes)
1	Ahmet	Subtraction	first grade	Introduction Progression1 Progression2	4.4 9.54 3.40
2	Ebru	Geometric figures	fourth grade	Introduction Progression1 progression2	3.13 10.27 13.26
3	Tugba	Cube	fifth grade	Introduction Progression1 Progression2 Closing	0.58 15.14 5.6 9.56
4	Demet	Symmetry	fifth grade	Introduction Progression1 Progression2	4.16 6.18 11.22

The researcher proposed students to follow the below steps to make more meaningful comments,

- Please read the lesson plan before viewing the video,
- Take notes while you are viewing video,
- You may view videos with some of your peers and discuss with them,
- Take attention following guide while you are viewing videos,
    - What is the topic of the lesson? Which activities does video teacher do
    - How do video teachers guide children?
    - Owing to video activities, which skills do children develop?
    - If you were video teacher, which contribution would you do to lesson plan?
    - Suppose that you have a diverse student in your class. In this situation how you adapt video activities for him/her?
    - Do you propose any measurement type for this course?

3.7. PHASE 3. Voluntary participation

In the third phase, a new research design was applied to provide an opportunity to observe the dynamics of online community of practice environment when the same pre-service teachers participated to the environment voluntarily. To achieve this aim, in addition to the teacher candidates of the second phase, inservice teachers and academicians also voluntarily participated to the PDC. To increase the number of members of the environment, the researcher announced the portal in some web sites and discussion lists. In addition to preservice teachers of phase 2, 30 classmates of the METU students registered to the PDC.

The third phase of the study was conducted from January 1st to June 30th, 2006. In this part, similar to the previous term, new discussion topics were determined (Table 3.5). The term was divided into four periods and each took approximately one month. Beginning and ending dates were a bit flexible. Sometimes intensive discussions required to extend the periods. Discussion topics were Students' attitudes toward Mathematics, Multiple intelligence theory and Mathematics, Fractions and misconceptions, and Drama and geometry.

Table 3.5

Discussion terms in voluntary participation term

Term	**Date interval**(2006)	**Topics**
June	04 June / 01 July	Students' attitudes toward Mathematics
May	07 May /03 June	Multiple intelligence and Mathematics
April	03 April/ 06 May	Fractions and misconceptions
March	27 February / 02 April	Drama and geometry

Three of the discussions were started by the researcher and the other discussion was started by the moderator who was one of active participants in the Phase 2. In every beginning e-mail, the researcher aimed to take the members' attention. Therefore, she asked simple questions related to the discussion topic or cited some words from research reports. The moderator student also followed a similar way. For example, in April, the moderator asked following question to the members,

> Siz olsaydınız, öğrencinizin "Öğretmenim, neden kesirlerle toplama ve çıkarma işlemleri yaparken payda eşitliyoruz da çarpma ve bölme işlemlerinde payda eşitlemiyoruz?" sorusuna nasıl bir yanıt verirdiniz?

> As a teacher, how would you answer the question "We find Least Common Denominator while we are adding and substracting two fractions but why don't we do this for multiplication and dividing?" (S23, 9 April 2006, 01:16)

3.8. Sampling and selection

Sampling means principles and procedures used to identify, choose and gain access to relevant units which will be used for data generation by any method (Mason, 1996). Qualitative researchers use purposive sampling with the aim of selecting information rich cases for the study in dept (Patton, 1987). Sampling is required since the researcher can not record or observe everything in the field (Ritchie & Lewis, 2003). Sampling and selection in this study are mentioned into three subheadings. Sampling of Phase 2 includes information about the process of selecting instructors, determining their appropriate courses and their students. Sampling of Phase 3 includes information on participants selection and sampling of the participants who were interviewed. Finally, the selection of the interviewees was presented.

Sampling for phase 2

Phase 2 was a mandatory participation term and sampling decision in this term affected the Phase 3. In the beginning of the research, the researcher firstly determined the universities which would participate to the study. Then, the instructors from three different universities were selected. The first university was Middle East Technical University (METU) since the researcher was working for this university. Being easily accessible was the main selection criterion of students. Then, since the topic of the PDC was Mathematics Education, the researcher arranged a meeting with one of the instructors of Elementary Mathematics Education Program. This instructor had experience on a different web based learning environment for pre-service teachers when he was in the USA. In the meeting, the instructor also gave some suggestions related to course outline (look title 3.5). After the first participant university was determined, the researcher sent e-mails to four different mathematics educators from different universities, to inform about the aim of the study and what they would think to participate to this study. She did not know them before. Two of these academicians replied her e-mail positively. The other did not reply. She decided to work with those two universities: Ankara University (AU) and Canakkale 18 Mart University (COMU). The researcher met with the instructor from AU face to face. However, since the other instructor lives in a distant city; a phone contact was made to discuss about

the details of the project. After conversing with these academicians, she realized that those universities do not have an Elementary Mathematics Education program. The instructors were working in the primary education department. After the researcher's mutual conversation with three instructors, the common point of their students was that all prospective teacher candidates would teach mathematics to children. The literature also included samples including different type teacher candidates. For example, a recent study' s sample also composed from preservice elementary and special education teachers since they designed instruction to provide access for all students, including those with disabilities (Kurtts, Hibbart & Levin, 2005). So, "mathematics teaching" course for AU students and "School practice II" for COMU and METU were selected to integrate the PDC as a part of these courses.

Totally, 28 students participated to the second phase of the study. As more detailed, 11, nine and eight students from METU, AU and COMU, respectively, involved in the study. Determination of the students was made by the instructors except for METU. There were 41 students from METU taking the School Experience course. The researcher selected every fifth student in the student list until the 11th student. The remaining 30 students participated to the PDC with a similar course outline and they made their discussions in another discussion list. All participants were fourth year preservice teachers. 20 out of 28 participants were female. Most of the participants in each university were also female. The participants' technology use background is shown in results chapter.

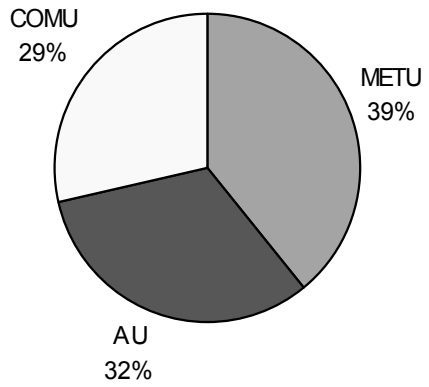


Figure 3.12 Distribution of the teacher candidates according to their universities

Sampling for phase 3

Since the aim of the third phase was to understand what preservice teachers would do in a voluntary participation environment, Phase 2' s preservice teachers participated to the Phase 3. The characteristics of the participants were described in the prior heading. In addition, the mentioned 30 additional preservice teachers from METU were added to the discussion list "matematik_ogretiyorum@yahoogroups.com" in which 28 preservice teachers from three universities communicated in the fall term. The other participants were volunteers and they met with the PDC while they were searching on the Internet. Therefore, in addition to these determined preservice teachers, inservice teachers, academicians and other preservice teachers from various universities registered to the PDC.

Selection of interviewees

In Phase 2, the researcher collected the data from all participants obtained by discussion list history, reflection reports and observation. Therefore, she did not make any sampling in this process. In Phase 3, the researcher needed to interview with the participants about new environment. However, she could not reach all of them. So, sampling was a must. Owing to sampling, the researcher talked with some of them about both mandatory participation term to be able to make triangulation and about the voluntary participation term to evaluate the new term. The researcher used maximum variation sampling. Patton (1987) defined the logic of this type of sampling "capturing and describing the central themes or principal outcomes that cut across a great deal of participant" (p.53). So, the researcher selected the interviewees according to their participation status. Three active preservice teachers and three passive preservice teachers were selected from the three universities. Furthermore, two students from each university were selected (Table 3.6).

3.9. Data collection methods and instruments

Creswell (1998) defines data collection methods as observations, interviews, and documents. This study used following multiple information sources;

1. Observation
2. Interview with pre-service teachers about the two phases of the research requiring mandatory and voluntary participation.

3. Documentation: reflection reports submitted at the end of the phase II, history of discussion list.

Observation

Observation technique is a data collection method in any environments in which behaviors take shape. It is used to take shape of behavior not being said. Some advantages of observation are 1) natural environment, 2) prolonged analysis, and 3) behaviors, not verbal (Yıldırım & Simsek, 2004, p.140). Therefore, in this research study, one of the data collection methods was observation. Firstly, the data which were obtained by observations presented facts more exactly since some behaviors occur only in natural environment. Secondly, as the researcher studied with participants in a long time, the participants familiarized with the researcher. Owing to this situation, she could ensure trustworthiness between herself and preservice teachers. In online environment, this is achieved by participation to all online activities. Thirdly, observation provided comprehensive information about all characteristics of participants related to the topic not explained during interviews.

In this study, the researcher directly attended the face to face classes of the universities to learn what happened in the university context. So, observation technique provided some supporter information in addition to interviews. The data on actions and relationships among subject were obtained. Further, by observation, the researcher aimed to eliminate difficulties in interviews. Owing to observation, she completed missing information in interviews and reflection reports. The role of the researcher was participant as observer. She participated fully in the activities in the PDC. To record observation results, the researcher kept a diary. For example, after visiting the class during to term she wrote a short diary about her observation results of the participants.

Finally, the observations served as an assistant of interviews and documents. So, the researcher made her results more robust about the participants' experiences in the environment, how they behave in a virtual community of practice and how the quality and complexity of interactions among them.

Interviews

The most widely used data collection method in qualitative research studies is interviewing. The purpose of interviewing is to find out what someone else's mind has. It

allows us to see the other person's perspective, experiences, feelings, and insights. Advantages of interviewing are "1) flexibility, 2) reply rate, 3) behaviors not being seen, 4) the control of the environment, 5) the order of the questions, 6) comprehensiveness, 7) in-depth information" (Yıldırım & Simsek, 2004, p.110).

The interviews served as a way to get information about how teachers evaluated their experiences requiring both mandatory participation and voluntary participation. In this research study, the interviews were conducted at the end of Phase 3. Interviewees evaluated both Phase 2 and Phase 3. A semi-structured interview schedule (Appendix F3) was used. The questions did not lead the respondents to confirm the researcher's assumption. Further, some probes were presented to get answers. All interviews were audio taped. Interviews were held through face-to face meetings with participants from Ankara and MSN interviews with participants who lived in Canakkale. The researcher selected six participants to interview. Three of them were active members in the spring term while the others passive members. In addition, two students from each university were selected for interviewing. Interview schedule was composed of two parts. First one was related to the Phase 2 and second one was related to Phase 3. Therefore, the durations of interviews and their word counts which give the readers about the complexity of the interviewes were reported. Total interview duration was 272.91 minutes with 27,413 words. Furthermore, average interview duration for each participant was 22.35 minutes with 2261.6 word count.

Document analysis

Generally, the term "document" refers to broad range of written and symbolic records, as well as any available materials and data. In Phase 2, documents were reflection reports and discussion list message history. Every student sent their reflection reports at the end of the term to the instructor. Deadline of reflections was January 1, 2006. The requirement for this submission was only sending their reflection reports. That is, no grade was given for the content of the reports. The aim of the report was to obtain all students' experiences. So, the participants' overall evaluation of the PDC and interactions among group and between groups were investigated by open-ended questions (Appendix D). E-mails which had come to the researcher and to the discussion list provided rich data related to Phase 2. In Phase 3, the documents were discussion list messages and the researcher. These documents also provided sufficient data for the Phase 3

Table 3.6

Characteristics of the participants interviewed

Name	**Universities**	**Participation type**	**Interview Date/ Hour**	**Interview place**	**Interview duration (minutes)**	**The word numbers in transcribes**
S23	AU	Active	02/06/06 :14.50	AU seminar room	33.10[a] 16.90[b]	3751[a] 2102[b]
S26	AU	Active	02/06/06 :13.30	AU seminar room	31.40 27.36	3403 2506
S15	COMU	Active	05/06/06 :10.40	MSN	23.33 30.27	2269 2600
S14	COMU	Passive	07/06/06 :21.15	MSN	22.15 23.08	2156 2217
S9	METU	Passive	24/05/06 :17.10	The researcher' office	29.20 15.85	2995 1952
S4	METU	Passive	20/05/06 :13.52	Her dormitory	20.18 22.24	2115 2072
				$\sum_{n=1}^{6} a_n$	137.21	13694
				$\sum_{n=1}^{6} b_n$	135.70	13449
				$\overline{X}_a$	22.86	2282
				$\overline{X}_b$	22.61	2241

[a]. Interview related to first phase
[b]. Interview related to second phase

3.10. Data analysis

In this study, lots of data were obtained owing to various data collection tools since the duration of the field work was sufficiently long. Therefore, the researcher had a heavy burden to analyze these data. According to Creswell (1998), data analysis is "the process in which one enters with data of texts and exits with an account or a narrative". He matched data analysis process with "a spiral image" rather than a linear approach (p.142). Similarly, the data analysis process began with the collection of the data and finished with a written narrative. This process was not linear. The researcher frequently had to turn back to previous steps to make corrections. The data analysis process has two parts: analysis of mandatory participation term and voluntary participation term. Although the analysis of these terms was mentioned separately, their analysis was sometimes conducted synchronously.

The researcher began to analyze with the mandatory participation term since this term was before the voluntary participation term. In this term, she had 28 reflection reports, 200 discussion list messages, six interviews and lots of individual messages which were sent to ask questions or to search solutions to problems. To be able to see the whole picture of the mandatory participation term, the researcher needed to read all data. But the data had different formats. Therefore, the researcher could not focus to analyze. She began with the reflection reports. The reports had different writing styles and some writing mistakes. Furthermore, some of the participants sent their reflections not as an attachment but rather as a text in their e-mail. Therefore, the reports were converted to MsWord and Turkish character mistakes in all were corrected owing to find and replace command of the MsWord. All reports were formatted with the same font type and font size. The researcher's questions were made bold. This same format made more readable the reflections. In addition, to be able to note something next to the answer of questions the researcher made blank right hand of the papers. Then, she printed all reflections. Secondly, she transcribed the interviews and formatted them similar to reflection reports. Thirdly, discussion list messages were formatted. These messages had been carried to MsWord as soon as every discussion period closed. Each message had a title showing its sender, the date, and subject. Again, each page is right side kept blank to note codes.

After these corrections, the researcher began to analyze by reading twice all reflection reports without a paper or pencil. So, she could grasp the whole picture. Then, she followed two main ways. First, she investigated reflection reports according to each questions. Secondly, she looked at the reports as a whole not according to questions. She searched codes and themes in all reports related to the critical factors affecting the quality of the interactions among the participants in the PDC.

Firstly, she could quantify the participants' simple answers. For example, the researcher found the simple answers of following questions "what is the preservice teachers' impression about the PDC" (negative or positive) or whether or not the participants wanted to participate other preservice courses similar to the PDC (Yes, No)". After the participants' simple answers were noted the left hand of the paper, their reasons were investigated more detailed. The researcher noted each reason and quantified them. To be able to reach the perfect codes and true quantities, the researcher read all reflection three times and re-coded them. In Figure 3.13, it is shown one of the participants' reflection reports with codes. This analysis has not been sufficient to write up the results section. The researcher needed to validate the results of reflection reports. Therefore, she began to analyze the interviews and discussion list message history. She searched for confirming or disconfirming evidences in this data set. So, after she validates the answers and the reasons she wrote up the part "evaluation of the PDC in mandatory participation term".

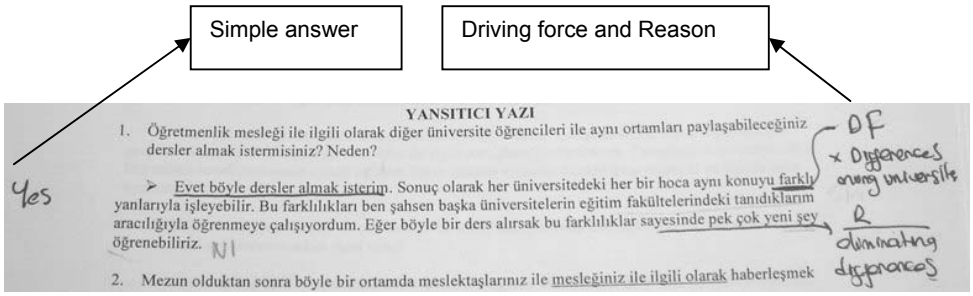


Figure 3.13 A coded reflection report shot.

Secondly, the researcher reread all reflections with the aim of critical factor affecting the quality and quantity of discussions. They determined new codes and validate them with reflection reports and discussion list message history.

After the mandatory participation term, voluntary participation began. The researcher transmitted all messages to MsWord with their title (her sender, the date and subject). In this term, the researcher began the analysis with the interviews. All interviews were read carefully. Similar to previous term, all questions were analyzed based on simple answers and then based on codes and themes. Finally, the results were validated by discussion list messages and the results section of voluntary participation term was written up.

Qualitative results of the study were also quantified. That is, written data obtained by observation, reflection and interviews transferred into numbers. Aim of this transformation is not to make generalization or searching a relationship between variables. Instead, its aim is

to present readers to the whole picture of coding. Yıldırım and Şimşek (2004) summarized basic aim to quantifying qualitative data as increasing the reliability, decreasing subjectivity, getting opportunity of comparing codes or themes. The researcher used SPSS and Microsoft Excel to analyze and represent the data (Figure 3.14). First of all the data were coded into four columns; Months, Participant types, Word count and Parts of a day. To be able to find the best representation of the data the researcher tried. During the word count analysis according to months and member type, the researcher omitted value 'zero' since this value showed that this member wrote any comment in the mail but rather she/he sent an attachment. Therefore, if it had not been omitted it would have decreased the mean of word in e-mails and thus the complexity of mails.

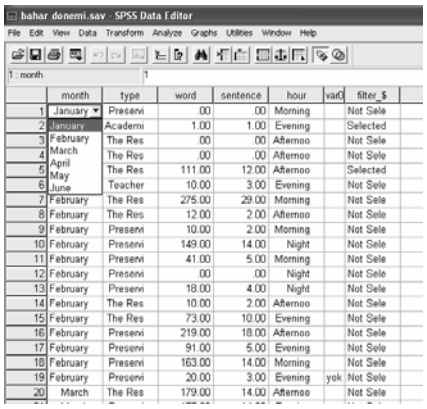


Figure 3.14 Spss coding of mandatory and voluntary participation term.

Coding plan of data coming from multiple data collection tools

As mentioned before, in this study there were multiple data collection tools. Therefore, during the analysis and representation of data the researcher needed a coding plan to be able to understand where the data came from. This coding plan is shown in Figure 3.15 Each display begins with the owner of it. Then, the university of the owner of the citation is presented. Finally, the information of where the researcher obtained this citation was presented.

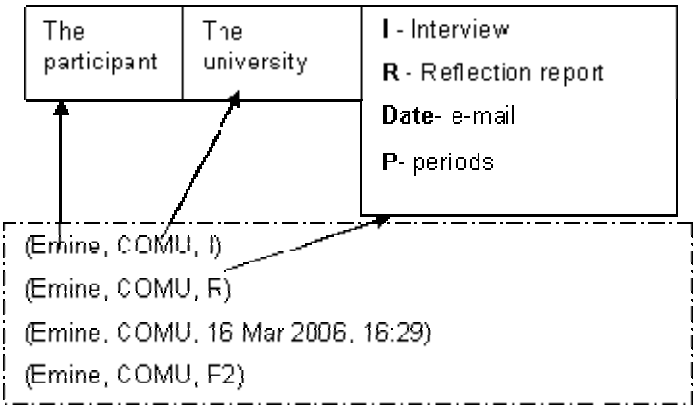


Figure 3.15 Codes used in data analyses.

3.11. Researcher's role

Goetz and LeCompte (1982) stated that researcher status position should be reported in since qualitative data depends on the researcher. The researcher is primary data collection tool. Therefore, this part of the report presents the researchers' perceptions about 1) understanding on research, and 2) role in the community that can influence the data collection, analysis, and interpretation.

As a researcher, her understanding of conducting research in instructional technology research studies has a flexible structure. She does not stick to only one methodology- quantitative or qualitative although her background is close to quantitative tradition. There may be some realities need to be investigated in-dept while there may also be some realities need to be interpreted in numerical form to generalize to a large population. In her opinion, characteristics of a phenomena to be investigated determine which research methodology should be used in the research. In this study, she preferred to use mainly a qualitative approach since communities of practice needs to be examined comprehensively

In addition, the researcher was a research assistant in three different universities in Turkey for eight years after graduation from the department of Statistic and Computer sciences. In her teaching experience, she particularly involved in web supported courses as an instructor and during her PhD education, she experienced only web supported courses as a student. In sum, the researcher did not experience e-learning before. However, her master study was on inservice teacher education. Therefore, she knows teachers and could estimate their behaviors, requests and expectations. This information had been beneficial in the design of the environment and in the Phase 3.

The role of the researcher changed in two terms. In the mandatory participation term, she participated in the research as participant as researcher and showed a neutral role among them. The researcher entered the environment with the identity of technical supporter staff. She solved the problems of the participants during whole processes during and after the course. The teacher candidates knew her with this identity. However, in the voluntary participation term, the researcher had been a part of discussions. She actively participated to the discussions and explicitly wrote her ideas to other participants.

As suggested by Rossman and Rallis (1998)' advices (cited in Yıldırım & Şimşek, 2004), the researcher

- observed the participants in natural environment,
- lived facts and events with them while she, in a researcher identity, also perceive facts and events without prejudicing,
- tried to reveal perception of them in the PDC,
- understood events in whole and different points of view and tried to reflect it,
- used different data collection methods,
- used her social skills to obtain data from the field,
- took into consideration ethical issues such as to harm the participants, lack of expression about the research to teachers, exaggeration of the data, etc,

3.12. Trustworthiness

Trustworthiness is the most important issue in qualitative research studies because it is directly related to research quality. In qualitative research studies, this concept refers to an umbrella encompassing reliability and validity in quantitative research studies. Further, Patton (2002) stated any qualitative researcher concern about this issue while designing a study, analyzing results and judging the quality of research. In this part, the researcher tried to present how trustworthiness of the study was under control.

Guba and Lincoln (1985) stated following four qualitative techniques which were used for establishing trustworthiness: a) credibility, b) conformability (or neutrality) c) dependability (or consistency) and d) transferability (or applicability) (cited in Golafshani, 2003). To establish trustworthiness of this research study, following strategies were used in the light of some qualitative researchers' proposals (Creswell & Miller, 2000; Creswell 1998; Goetz & LeCompte, 1982; Golafshani, 2003).

- **The presence of the researcher:** The researcher explained her social role and her ideas related to research in the methodology section. This information will guide the others wanting to conduct a similar study.

- **Descriptive presentation of the data collection and analysis:** In the method section, the process of data collection and the context of the study were presented in detail. Moreover, in the result section the researcher presented the data obtained by interviews, observations and document analysis in a descriptive way with the record of who said and what, under which circumstances because it enhances the replicability of the research.

- **Mechanically recorded data:** Mechanically recorded data allow preserving the raw data at the greatest rate. The researcher used a voice recorder during interviews. So, the researcher recorded all conversations without omitting any words.

- **Prolonged engagement in the field:** The researcher was in the research site for a long time. Owing to repeated access to the site, she built trust with participants.

- **Informant Choices:** Different informants provide different data to researchers. This threat can be handled by careful description of those who provided the data. In this study, the researcher selected six interviewees purposefully according to their activation in the PDC since she believed these participants gave the best information to the researcher. Their detailed description was presented in the heading 3.7.

- **Triangulation:** This method is the most common strategy to grant credibility of qualitative research studies (Goetz &Lecompte, 1982; Creswell, 1998, Patton 2002; Golafshani, 2003, Yıldırım & Şimşek, 2004). Patton (2002) advocates the use of triangulation by stating "triangulation strengthens a study by combining methods. This can mean using several kinds of methods or data, including using both quantitative and qualitative approaches" (p. 247). In this study different types of triangulation were made. In the result section, all of these triangulation were not presented but the determination of categories were used this kind of data.

  According to the first method the researcher used different source of knowledge (interviews, reflection report and document analysis) to sure accuracy of the codes. For example, in the mandatory participation term the researcher found a code "self confidence and being sophisticated" to determine why preservice teachers contributed to the environment in this term. She obtained this code from both interviews and reflection reports from different participants.

> Let me tell in the frame of being sophisticated in teaching. The more you are effective and sophisticated, the more you tell yourself more comfortably. If I know these topics, I can say. (S11, METU, R).

> Conversants… I know and I make this. They are passive because they don't know. I made this comments. As soon as she/he said "yes it is true", she/he finishes her responsibility. May be, she is not so kind that she will tell this (this agreement). She does not any idea about this topic (S23, from AU, I).

Second, the researcher collected data from the same participants in different times. There were some similar questions in interviews and reflection reports. Therefore, the researcher had an opportunity of comparing the same participants' idea from different source of knowledge. Furthermore, the researcher reached some participants by e-mail to request them more. For example, S9 mentioned in her interview one of her memories about asking question in the discussion list. It can be seen her talking in the discussion list message history in period 2.

> Because a question - answer series sometimes happened. I asked the participants from primary school "how do you do this, how do you that?" in these situations, I asked questions to them (S9, from AU, I).

> It [tangram] especially can be useful in drawing course. As a result, tangram figures can be created by using colorful cardboards in drawing course. The form in the first comment of S7 is appropriate for this. Of course, I don't know how much I am true. First step elementary school teacher candidates have more knowledge about gains of drawing course. I am asking whether or not this connection is true. (S9, from METU, P2)

In the third method, the researcher asked the participants' ideas which were stated in their reflection report to interviewees to evaluate. So, the researcher evaluated whether or not apparent codes from reflection reports consistent with the other source of data collection. For example, S4 evaluated a criticism of the other university student' ideas.

> **The researcher:** there was a criticism to you in reflection reports. They said that METU students replied only their own classmates' mails. What do you think about this topic?

> **S9:** I do not think so. But they might overrate themselves..

3.13. Limitation and delimitation of the study

As an accepted limitation of qualitative research studies, the sample of the research may be too small according to quantitative research studies. Therefore, it is not true to make generalization from the results of the study to a large population. This is the aim of experimental studies. Goetz and LeCompte (1982) in their study which aimed to compare experimental studies with qualitative studies noted researchers should keep diverse the application of the results in these two research tradition. The aim of qualitative research is comparability and translatability rather than generalize outright population. Comparability means delineation of the characteristics of the group studied or constructs generated so clearly that they serve as a basis for comparison with other like or unlike groups. Transferability requires delineation of research methods, categories, and characteristics of phenomena so that comparison can be conducted confidently (p.34). In this study the researcher took into account these two criterions and so in the method section she tried to present the entire research process as clearly as possible.

In addition, some participants in small sample tend to express views that may be contradict their real thought. Therefore, the quality of the data collection and the results are highly limited by honesty of the participants. Moreover, qualitative research studies are personalistic. Therefore, the research skills of the researcher gained more importance. Apart from experimental research studies which see researchers out their research studies, in qualitative research studies, researchers are the centre of the data collection and analysis. In this study, the researcher spent time in the field, directly interviewed the subjects, participated discussions with the subjects, and she lived the subjects' experience. Therefore, her perspective and the ability of reflecting her experience are directly related to the quality of the research. Furthermore, in qualitative research peer review had an important place to grant the validity of the research. The PhD studies are individual researches and PhD candidates had to collect and analyze data alone. In this research, the researcher asked one of her peer to check the codes but anyway the researcher was alone a long time in this study.

Sample of this study were limited to the preservice teachers who were determined by their university instructors. Therefore, the sample included the participants who had low technology use skills. In this technology depended research, these lacks of participants has been a limitation.

At the beginning of the research study, the researcher met with all university students by a face to face meeting. Also, during the mandatory participation term the researcher participated to the courses in AU and METU. However, she had not a chance to go to Canakkale to participate COMU student courses. Instead, she tried to overcome

possible problems by other methods. She called the instructor of these students and sent individual e-mails about whether or not there is a problem in their group to the COMU students.

Finally, the results of this study were limited by perspectives of preservice teachers. They evaluated their own professional development, the PDC, its applicability in other settings. These data were supported by the researchers' observations and document analysis.

3.14. Summary of the chapter

Third Chapter provided an overview of the methodology used in the study which aimed at addressing the question "*What are the dynamics of virtual communities of practice in pre-service teacher education?*" An understanding of the dynamics of online learning communities in pre-service teacher education was investigated through a qualitative research. The research process encompasses three main phases, design of the online environment, a courses design requiring mandatory participation of preservice teachers and a discussion environment allowing voluntary contribution of preservice teachers. Detailed design process of the Professional Development Circle (PDC) and research design of other two phases were mentioned in this chapter. Summarized information about research questions, data collection methods and data analysis format were presented in Table 3.7.

Phase 1 was related to design and development of the online environment. Owing to existing literature and conducting a small scale research, design decision were determined. So, the portal had materials, activities, lesson plans, real classroom videos, and forum. Furthermore, the portal had designed for only one teaching field. The name of the portal was determined as "Professional Development Circle (PDC)" and its target population has been mathematics teachers, academicians and preservice mathematics teachers. It has 258 materials in library part. "My videos" part includes 10 real class videos. Forum part has discussion topic related to mathematics education. Finally there is a communication part allows users to communicate. In addition to the portal, the members of it also registered an discussion list (matematik_ogretiyorum@yahoogroups.com) to communicate by e-mail.

Phase 2 included a course design requiring mandatory participation of the pre service teachers. The aim of this design is to understand the dynamics of online communities of practice environments when there is an obligation to participate in online discussions. To achieve this aim a course design was made for three university students (Table 3.3). These universities were Middle East Technical University (METU), Canakkale 18 Mart University (COMU) and Ankara University (AU). This application included five periods from October

5 to December 18. The first period was only one week and the responsibility of the participants in the period was to send meeting e-mails including information about themselves to the discussion list. Second period took three weeks while the others' durations were two weeks. Every period had a similar process; one of the universities started discussion; second university students added their comments and third university wrote a lesson plan in the light of coming criticism. In every period the responsibility of the universities changed so that every university had a chance of doing each activity. Every student was responsible to send three comments to the discussion list in every period. The participants were excluded to send e-mail to the discussion list if her/his responsibility was to write a Lesson Plan. The Data in this phase were collected by observation, reflection report, interviews and discussion list message history.

Third phase of the study is an examination of the online communities of practice environment designed for pre service teachers, in-service teachers and academicians. This design provides an opportunity to observe the dynamics of online environments when the same preservice teachers participated in the environment voluntarily. Third phase of the study has taken from January 1, to June 30. The term had mainly four periods according to month name. Discussion topics were 'students' attitudes toward mathematics', 'multiple intelligence and mathematics', 'fractions and misconceptions' and 'drama and geometry'. The Data in this phase were also collected by observation, interviews and discussion list message history.

Trustworthiness of the research study were under control by delineating the researcher role, descriptive presentation of the data collection and analysis, mechanically recorded data, prolong engagement in the field, and selection of subjects to give the best information to the researcher and triangulation.

Table 3.7

A brief look to research questions, data collection methods, and data analysis.

Research questions	**Terms**	**Research questions**	**Data Collection**	**Data analysis**
How do preservice teachers evaluate two environments (case 1 & case 2) ?	Mandatory (case 1)	• How are teacher candidates' general impressions from the environment? • How do participants evaluate their online experience when they compare it with other undergraduate courses? • What is the online environments' effect to teacher candidates' professional development? • What are the potential of the environment for preservice teacher education and inservice teacher education?	Mainly by reflection reports obtained from all participants. Triangulation with interviews, discussion list message history, private message exchange with participants and observation.	Qualitative methods By citation from the participants
	Voluntary (case 2)	• How do participants evaluate their voluntary online experience when they compare it with mandatory term • What is the online environments' effect to teacher candidates' professional development?	Mainly by interviews with six participants. Triangulation with discussion list message history, private message exchange with participants and observation.	* *frequency of codes were reported*
How do preservice teachers behave in two environments (case 1& case 2)?	Both cases	• -	Discussion list message history.	Quantitative methods, Frequency and percentage were presented
What are the critical factors influencing amount and quality of discussions?	Both cases	▪ What are the motivators? ▪ What are the barriers?	• Discussion list message history • Reflection reports • Interviews • Observation	Qualitative methods By citation from the participants and message history * *frequency of codes were reported*

CHAPTER 4

RESULTS

This chapter presents findings of the research questions which were stated in the first chapter. Related to the mandatory participation term, first of all, the participants' descriptive information was presented according to their universities. Secondly, evaluation of the PDC was investigated. Third, their behaviors and interactions during the discussions are explored. Fourth, reasons which affected the quantity and complexity of contributions to the discussion list were examined. Related to voluntary participation term, first of all membership history, message traffic, complexity of e-mails, e-mail amount according to the parts of a day are presented. Second, how preservice teacher accepted themselves in this new environment, their evaluation of the PDC and comparison of mandatory participation term with voluntary participation term was discussed. The last part presented the reasons which affected the quantity and complexity of contributions to the discussion list.

4.1. The Participants

Background information of the participants is a key factor which can affect the results of an online study. Therefore, the descriptive information of the participants was collected by a short survey at the beginning of the study (see Appendix D1). Gender, age, e-mail usage, home computer ownership, Internet access and usage patterns (duration, access points, and reasons to use) were investigated based on their universities.

4.1.1. Gender and age

20 out of 28 participants were female while only eight male participated in the study (Table 4.1). Ages of the participants were in a range of 21 to 24 (M = 21.85, SD = 1.07).

Table 4.1

Gender of the participants

Gender	**The Universities**			
	METU	COMU	AU	Total
Male	5	1	2	8
Female	6	7	7	20

4.1.2. E-mail accounts

Frequently used e-mail accounts of the participants were Yahoo, Mynet and Hotmail. More specifically, 16 out of 28 participants were using Yahoo for e-mail, while 10 participants were using Mynet. Only two participants were using Hotmail. Moreover, all METU students were using Yahoo and except for one Hotmail user, all participants from COMU were using Mynet. The participants from AU had e-mail accounts from three e-mail providers.

Table 4.2

E-mail accounts of the participants.

E-mail accounts	**The universities**			
	METU	COMU	AU	Total
@yahoo.com	11	-	5	16
@mynet.com	-	7	3	10
@hotmail.com	-	1	1	2

4.1.3. Home computer ownership

The participants' home computer ownership with the Internet connection was investigated to understand their opportunities to participate in online discussions. According to the results, only 10 out of 28 participants had a home computer in their homes. In particular, four, three and three participants from AU, METU and COMU, respectively, had a home computer. That is, less than half of the participants had a home computer. Moreover,

the results showed that only seven out of 10 participants had Internet access from their homes (Table 4.3).

Table 4.3

Home computer ownership and Internet connection.

Home computer ownership	**The universities**			
	METU	COMU	AU	Total
Yes	3	3	4	10
No	8	5	5	18
Home computer with Internet				
Yes	2	2	3	7
No	1	1	1	3

4.1.4. Internet connection duration

The participants' weekly Internet connection durations were investigated to understand how Internet connection duration affects their participation to online discussions. According to the results, most of the participants' Internet connection durations were between 1 to 5 hours. Eight participants' Internet connection duration was in a range of 6 to 20 hours. On the other hand, only three participants spent less than one hour while only one participant was connecting to the Internet more than 20 hours. The details are presented in the Table 4.4. Furthermore, the results showed that compared to others, METU students were spending more time on the Internet while the participants having the lowest connection duration were from COMU.

Table 4.4

Internet connection durations.

Durations	**The universities**			
	METU	COMU	AU	Total
< 1 hour	-	3	-	3
1-5 hours	4	5	7	16
6-20 hours	6	-	2	8
20> hours	1	-	-	1

4.1.5. Internet access points

Another important point which can influence the results of the study was Internet access points. The participants' Internet access points were determined as home, school, Internet café, dormitory and their friends' computer.

First of all, the participants rated their home as an Internet access point. The results showed that 21 participants had never used the Internet from their homes as presented in the section 4.1.3. Although 7 participants had Internet access in their homes, their first preference place to access the Internet was not their homes.

Secondly, their school environments were evaluated as an access point to the Internet. 17 participants put it in their second preference while six participants stated it as their first preference. However, there was only one student from AU who never accessed to the Internet from his school. In sum, most of the participants access the Internet from their schools as their second preference.

Another Internet access point was Internet cafes. 12 participants would rather connect to the Internet from Internet cafés as their first preferences. The results showed that mostly preferred Internet access point was Internet cafés.

Dormitory was another Internet access point. 14 out of 28 participants said that they never connected to the Internet from dormitories. However, all METU students accessed to the Internet from their dormitories. To sum up, most of the participants did not access the Internet from their dormitories while most of METU students connected to the Internet from their dormitories.

The last Internet access point was their friends' computer. Most of the participants did not use the Internet from their friends' computer.

If we summarize, it was revealed that the participants generally accessed to the Internet from their universities and Internet cafes. Apart from COMU and AU, only METU students accessed to the Internet from their dormitories. It was shown that their homes and friends' computer has been the least preferred Internet access point.

Table 4.5

The points which the participants accessed to the Internet.

Points	Universities	Preference order				
		Never	1st	2nd	3rd	4th
Home	METU	7	1	1	1	1
	COMU	8	-	-	-	-
	AU	6	-	-	1	2
	Total	21	1	1	2	3
School	METU	-	4	6	1	-
	COMU	-	1	6	1	-
	AU	1	1	5	2	-
	Total	1	6	17	4	-
Internet cafe	METU	4	1	1	4	1
	COMU	-	5	2	1	-
	AU	-	6	1	2	-
	Total	4	12	4	7	1
Dormitory	METU	-	5	4	2	-
	COMU	7	-	-	1	-
	AU	7	1	1	-	-
	Total	14	6	5	3	-
Their friends' computer	METU	7	1	1	1	1
	COMU	8	-	-	-	-
	AU	6	-	-	1	2
	Total	21	1	1	2	3

4.1.6. Reasons for connecting to the Internet

The last issue related to the participants' Internet use profile was their reasons for connecting to the Internet. The participants rated how frequently they connect to the Internet for the following purposes; doing homework, getting online certificate, participating forum, membership to discussion list, chatting, accessing to information, banking & shopping and playing games.

The participants generally connected to the Internet for their homework. More specifically, METU students almost always while AU and COMU, often used the Internet for homework purposes. Being asked which web sites they use to do their homework, they listed the following search engines; google.com, yahoo.com, askjeeves.com and arabul.com. According to them, these search engines were very helpful to access interesting educational web sites. Moreover, educational portals which they used for their homework are meb.gov.tr, matokulu.com, odevsitesi.com, ttkb.meb.gov.tr, egitimciyiz.com.tr, egitim.com, ogretmenlersitesi.com, seslisozluk.com, matematikci.org, mathforum.com, sitesforteachers.com and learner.org. The web sites with English content were proposed by METU students.

The participants were also asked whether or not they had attended any online certification program. None of them had participated in any distance education program through the Internet.

Another online service 'Forum' was rated by the participants. According to their answers, 20 out of 28 participants have never used a forum and only remaining eight participants had used it. This showed that generally the participants had not use the Internet for accessing forum environments. Only eight participants listed which forums they participated in as forumtr.com, matokulu.com, sinifogretmeni.com, haberborsa.com and mathforum.com.

The participants' familiarity to discussion list usage frequency was also investigated. 15 out of 28 participants reported that they had never used discussion list before. Eight METU students said that they almost always use the Internet for discussion list. The results showed that METU students used discussion list more than COMU and AU students. In particular, the discussion list which they have been the members of them are egitim_toplulugu, matematik, metu_eme, ele443_2005, method336 and eme2002. Out of their profession, they were also the members of the following discussion lists; origami_tjit, kutahyagenclikkulubu, kutahyaodtu and Ilkyar. These entire discussion lists came from METU students. One student from COMU reported her e-mail account as a discussion list name and one student from AU reported a web site. That is, there were some participants who did not know even the meaning of discussion list.

One of the reasons for connecting to the Internet was e-mail usage. 17 participants often used the Internet to send and receive e-mails. Investigating more detailed, it was found that METU students used the Internet to send e-mails more than COMU and AU students.

Chatting was another investigated reason for connecting to the Internet. Most of the participants, 13 out of 28, had never used the Internet for chatting.

Most of the participants 13 out of 28, said that they often used the Internet to access information. Furthermore, the other seven participants almost always used the Internet to read newspapers or to explore e-government applications.

Another investigated reason for connecting to the Internet was 'Banking & shopping'. 17 participants claimed that they had never used the Internet for this purpose. Similarly, 10 participants had used it rarely. On the other hand, only one student had sometimes used the Internet for banking & shopping purposes. In sum, generally, the participants did not use the Internet for this aim.

The last reason was playing game. 13 participants stated that they had rarely used the Internet for gaming while five participants never used the Internet to play games. The results showed that the participants did not prefer to use the Internet for gaming.

Table 4.6

Reasons for connecting to the Internet.

Reasons	The Universities	Frequencies				
		Never	Rarely	Sometimes	Often	Almost always
Homework	AU	-	-	-	5	3
	METU	-	-	-	3	8
	COMU	-	-	3	5	-
	Total	-	-	3	13	11
Online certificates	AU	9				
	METU	11	-	-	-	-
	COMU	8	-	-	-	-
	Total	28	-	-	-	-
Forum	AU	7	1	-	-	1
	METU	6	2	2	1	-
	COMU	7	1	-	-	-
	Total	20	4	2	1	1
Discussion List	AU	8	-	-	1	-
	METU	-	-	1	2	8
	COMU	7	-	1	-	-
	Total	15	-	2	3	8
E-mail	AU	-	3	-	5	1
	METU	-	-	1	7	3
	COMU	-	2	1	5	-
	Total	-	5	2	17	4
Chat	AU	5	2	1	1	-
	METU	4	2	3	2	-
	COMU	4	2	-	1	1
	Total	13	6	4	4	1
Newspapers, e-government applications	AU	1	-	2	4	2
	METU	-	1	1	5	4
	COMU	-	2	1	4	1
	Total	1	3	4	13	7
Banking & shopping	AU	6	2	1	-	-
	METU	5	6	-	-	-
	COMU	6	2	-	-	-
	Total	17	10	1	-	-
Game	AU	3	3	1	2	-
	METU	-	6	3	1	1
	COMU	2	4	2	-	-
	Total	5	13	6	3	1

4.2. Evaluation of the PDC

The Professional Development Circle (PDC) was evaluated by the participants' reflections which were submitted to the researcher at the end of the term, and by conducting interviews with selected six participants at the end of the voluntary participation term. Discussion list message history was unique data source. In this part, the participants' perspectives on the topics 'general impression', 'the PDC's contributions to preservice teachers professional development' and 'the PDC's potential use in pre-service and in-service teacher education' were investigated.

4.2.1. General Impression

In their reflections, the participants stated their positive and/or negative impressions about the PDC. The results revealed that 25 out of 28 participants had positive impression toward the PDC environment while the remaining three from AU and METU were negative. The interviewed five participants had positive impressions parallel to reflection reports except for one student from AU (Figure 4.1). This student mentioned partially positive opinion in her reflection report while in the interview she had completely positive attitudes.

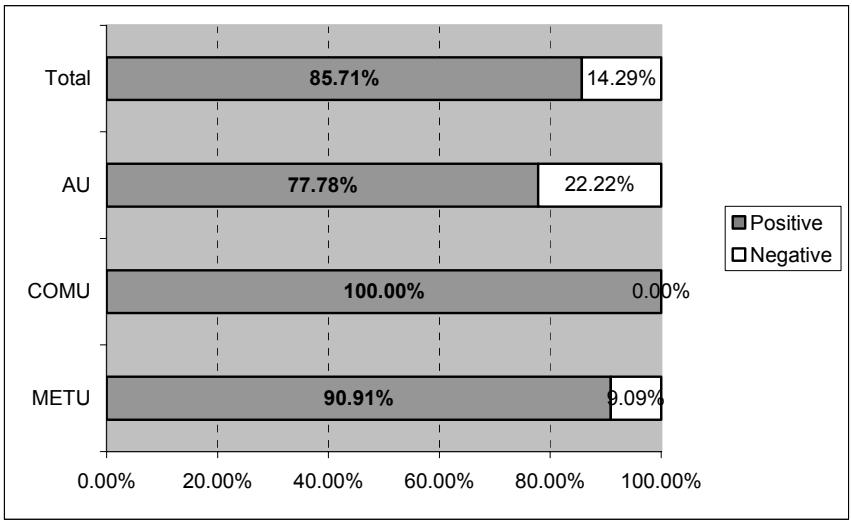


Figure 4.1 General impressions of the participants according to the universities.

Detailed analysis of the data revealed that there were three different opinions; 1) completely positive, 2) partially positive – stated by the participants who had a few criticisms in addition to their positives ideas, and 3) completely negative.

Completely positive comments

The participants defined the PDC as entertaining, flexible, joyful, pleasant, interesting, beneficial, activating, different, effective, encouraging different views and providing time and place for mobility environment. For example, one of the participants claimed that this experience was different for her since she had never taken a course on the Internet similar to this environment. Further, the PDC changed her Internet usage habits.

> Bu deneyim öncelikle benim için farklıydı. Hayatımda en çok bilgisayarla ilgilendiğim, internet kafede zaman geçirdiğim dönemdi. Ayrıca bu deneyim sayesinde maillerime bakmayı alışkanlık haline getirdim. Acaba yorumlarıma cevap olarak neler yazıldı merakını yaşadığım zevkli ve olumlu özellikler kazandıran bir dönemdi.
>
> First of all, this experience was different for me. In my life, it was the time that I was so much interested in computers and spent such a long time in Internet cafes. Moreover, owing to this experience I was accustomed to checking my e-mails routinely. It was a term in which I gained good habits and I was curios about what have been written to my comments (S15, from COMU, R).

Another student emphasized that the PDC contributed her professional knowledge positively,

> Bu deneyim bende genelde olumlu izlenimler yarattı. Çünkü edindiğim bilgilerin ilerde meslek hayatımda bana yardımcı olacağını düşünüyorum. Mezun olduktan sonra da deneyimlerimi ve önerilerimi MGÇ portalında paylaşmaya devam edeceğim. Aynı zamanda eğlenceliydi. Videoları izlerken büyük bir zevkle izliyordum.
>
> This experience created generally positive impressions on me. Because, I think about that this experience will be helpful in my future professional life. After graduating, I will also continue to share my experiences and ideas in the PDC. It was also entertaining. I watched the videos with great enthusiasm. (S12, from COMU, R).

Partially positive comments

Partially positive participants were ones who had a few criticisms in addition to their positives ones. They were generally positive towards the PDC. Their negative opinions were about demanding environment and mandatory participation. One participant said,

> Beni daha aktif bir öğrenci yaptı diyebilirim. Evden sınıfı gözlemlemek çok güzeldi. İnternet ortamından bilgi alışverişi yapmak çok eğlenceli, bazen yorucu oldu evet; ama bunlar tatlı yorgunluklardı. İlerde yapmamız gerekenleri daha iyi öğrenmemiz açısından gerekliydi.
>
> I can say that it made me a more active student. It was superb to observe classroom environment at home. It was very enjoying but sometimes demanding to exchange information on the Internet environment. It was a good challenge. It was necessary in terms of learning the things better that we should do in the future. (S23, from AU, R).

Two participants claimed that they had negative attitudes toward the PDC at the beginning of the term. However, their opinions have changed in the middle of the term. One of them mentioned the same experience both in her reflection and in her interview. She said,

> Her şeyden önce benim bu deneyimle ilgili hiçbir olumsuz düşüncem yok. Başlangıçta önyargılarım vardı. Ancak işin içine girince bunlar da yok oldu. Ben açıkçası araştırmayı pek sevmem. Bu tür ödevler bana hep yorucu ve itici gelmiştir. Ama bu deneyimi sonradan gerçekten çok sevdim. En yoğun olduğum zamanlarda bile bana eğlenceli geldi. Arkadaşlarımın gönderdiği yorumları büyük bir zevkle takip ettim. Benim için çok eğlenceli ve etkili bir deneyimdi.
>
> First of all, [today] I do not have any negative idea about this experience. [However] In the beginning, I had some prejudgments. They all disappeared when we started to study. To be honest, I do not like to make research. These kinds of homework were always tedious and repulsive for me. But later I really did like this experience. It was entertaining even in my business times. I pursued comments, which my friends sent, with a great relish. It was very absorbing and effective experience for me (S9, from METU, I).

The other student mentioned that she never had a such experience prior to the PDC and her ideas had changed during the process,

> Böyle bir şeyin başka bir ders içine sıkıştırılması fikri en başta bana çok itici gelmişti. Daha önce böyle bir deneyim yaşamamıştım, hatta duymamıştım bile☺ Ama olayın içine girdikçe eğlenceli gelmeye başladı. Gerçek bir ders üzerinden yeni etkinlikler üretme fikri hoşuma gitmişti. En zor olan kısım ise ders planı yazmaktı. Gelen bütün yorumları tekrar tekrar okumak, değinilmesi ya da üzerinde durulması gereken konuları akıcı bir sıraya koymak ve bütün bunları birleştirip yeni bir ders planı oluşturmak gerçekten

yorucuydu☺ Ama en genel haliyle ifade etmem gerekirse bu deneyim bende pozitif bir izlenim bıraktı.

I thought that the idea of including something like this into a lesson was very disturbing in the beginning. I never had an experience like this, and I never heard it. However, it has been very entertaining for me after I was more involved in the study. I enjoyed producing new activities for a real classroom. The most difficult part of the study was to make lesson plans. It was really tedious to read all the comments again and again, to arrange important topics and to create a new lesson by combining these topics. As a consequence, I was impressed from this experience positively (S7, from METU, R).

Completely negative

The participants who had completely negative opinions about the PDC stated two reasons; heavy study load and mandatory participation. Two participants supported the idea of 'heavy study load'; the other student criticized mandatory participation. These negative ideas were from AU and METU. One of them said,

Zaman zaman yorucu olduğunu söyleyebilirim. Boş vakitlerim de yaşadığım dönemlerle, yoğun zamanımda yaşadığım dönemler arasında bile farklılıklar vardı. Gönderilen maillerin hepsini detaylı olarak okumak ve bunlara cevap yazmak vakit alıcı bir işlem olduğunu düşünüyorum.

It was sometimes exhausting. There were differences among periods I contributed in my free times or busy time. In my opinion, it was time consuming to read all messages in detail and to reply them (S21, from AU, R).

One of the participants who supported voluntary participation said,

Ben öğrenim olabilmesi için gönüllü olmanın zorunlu olduğunu düşünüyorum. Çünkü bana dışarıdan yapılan baskıyla bir siteye girip yorumlar yapmam, ders planı hazırlamam ve hatta bu yaptığım çalışmalar üzerinden MGÇ deneyimi üzerine yorum yapmam isteniyorsa burdan iyi birşey çıkmıyor. Zaten bunu benim siteye bağlı olduğum zaman ölçüldüğünde ilk başlarda daha fazla aktifken daha sonra hızla azaldığı gerçeği de gösteriyor.

I think that being voluntarily is essential to learn. Owing to an external pressure, if you want me to make comments after watching videos, then to prepare lesson plans and consequently to make comments on the PDC about my prior studies, the results would not be satisfying. Anyway, when you look how many times I had accessed to the web site, you will see that while I was a more active member in the beginning, later the count decreased significantly (S10, from METU, R).

4.2.2. The PDC's effects on the participants' professional development

The participants evaluated the PDC's effects on their professional development when they compared this experience with other pre-service courses, which they had taken before. 24 out of 28 participants said that their professional knowledge was improved owing to the PDC. However, according to two out of nine participants from AU, the PDC did not make any contribution to their professional knowledge. Furthermore, the other two participants did not make any comment on this issue since they thought that they could not use the environment effectively (Table 4.7). Taken together, almost all participants from METU, COMU and AU talked about how the PDC made positive impact on them while only a few participants from AU expressed opposite ideas. Data from the interviewees and discussion list message history supported the participants' reflections.

The results are reported under three titles; 1) construction of other courses. In this section, the participants compared the PDC experience with other courses which had taken before the PDC. 2) The PDC's contributions to their professional knowledge. In this section, positive contributions of the environment to their professional knowledge were discussed. 3) Negative opinions. In this section, negative comments were presented.

Comparison with other courses

12 out of 28 participants used one of the terms 'theory based', 'practice based' and 'English based' to define previously taken courses while the other 13 participants preferred to use a general term 'the other courses'. In particular, six participants used 'theory based' term to describe the courses including no practice while five participants used 'practice based' term to describe some courses such as school experience (Table 4.7). Moreover, some participants mentioned these courses as a supporter for the PDC although some of them emphasized lacks of other courses to make strong their thesis 'PDC made more positive contribution'.

Lacks of other courses and benefits of the PDC

The participants mentioned lacks of other courses as only theory based and not applicable activities, which was not appropriate for real classroom environments. So, they presented some benefits of the PDC environment as,

- Being knowable about the practice,

- ❖ Having different perspectives,
- ❖ Beholding novel teachers' experiences,
- ❖ Not repeating faults in the videos,
- ❖ An opportunity to observe various teachers' classrooms although they can observe only one or two teachers in their school practice courses,
- ❖ Obtaining experience about new curriculum (Table 4.7).

Transition from theory to practice

Apart from these contributions of the PDC, some participants in their reflection reports claimed that other courses have been a base for the PDC. That is, obtaining information from other courses made it easy for them to produce comments during the PDC discussions. We can see some examples from the discussion list message history. The participants transmitted their prior theoretical knowledge in their comments.

For example, one of the participants evaluated the activity in the second discussion period which was based on discovery learning and which she had learnt from a face to face theoretical course. That is, the student made connection discovery learning and the activity. So, she learnt how this theory put into practice.

> Dersin işlenmesinde, öğretim stratejilerinden, buluş yoluyla öğrenme daha uygun tabi ki. Bunun için dersin başlangıcında öğrencilerin hazır bulunuşluk durumlarını ölçmek ve ön bilgilerini belirlemek gerekir ki, öğrencilerin geometrik düzeyleri ortaya çıksın. Bunun için hazırlanan karşılaştırma matrisi, kavram haritası, kavram ağı dersin girişinde oldukça işe yarar ve derse dinamizm katar.
>
> Discovery learning, which is one of the learning strategies, is more appropriate to teach this lesson. In the beginning of the lesson, measuring situation of students' being ready [for the lesson] and determining their prior knowledge is essential to understand their level of geometry. Concept maps, comparison matrices and concept net prepared for this aim are very beneficial in the beginning of the lesson and they make the lesson more dynamic. (S23, from AU, P2)

Another participant connected the reason of effectiveness of the activity with the age of children according to Piaget's stages of cognitive development.

> …Ben ilk yorumumda bahsettigim gibi yapılan etkinliği genel olarak beğendim hatta şimdiye kadar yapılan etkinlikler arasında en etkili olan Tugba hocanın etkinliği idi diye düşünüyorum. Bunda birazda öğrencilerin yaş düzeyinin büyük olması öğrencilerin somuttan soyut işlem dönemine geçiş düzeyinde olması vs. özelliklerin de payı var diye düşünüyorum.

> As I stated in my first comment, I liked this activity and in my opinion, the teacher Tugba's activity was the most effective one among prior activities. I think that the ages of the students and thus their being in development age, which is a term from concrete operational stage to operational stage, have some effects. (S26, from AU, P3).

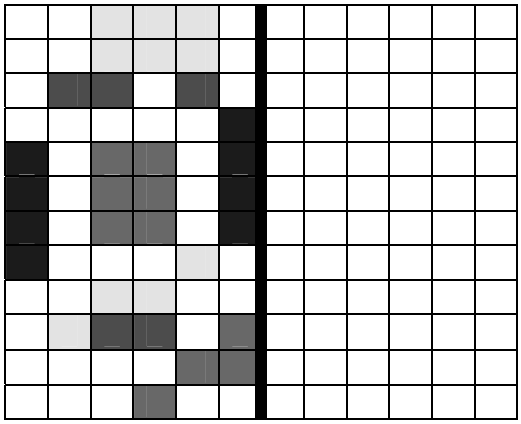
Another participant evaluated the activity with learner centered teaching which is one of the strategies of constructivist learning theory.

> Bence ders kazanımlarına uygun, planlı bir şekilde işlendi. Öğrenci merkezli, keşfetmeye dayalı örnek bir etkinlikti. Böyle derslerin işleniyor olması eğitim açısından umut verici diye düşünüyorum.
>
> In my opinion, the lesson was thought appropriate to its gains. It was a learner centered activity which requiring discovery learning. I think that such lessons are very promising for education. (S12, from COMU, P3, p.5)

Sharing practical knowledge in the PDC environment

Some participants in their reflections claimed that they transmitted practical knowledge, which they had learned in their face to face classes, to the PDC environment. For example, during period four -symmetry activity- one of the participants shared an activity with the others (see following figure),

> … Ayrıca gecen hafta arkadaşlarımız bize sınıfta simetri konusunu anlattılar ve internette gerçekten çok güzel etkinlikler varmış gerçi biraz olanak isteyen etkinlikler ama belki bilgisayar ve projectörümüz olursa öğrencilerimize farklı şekilde de gösterebiliriz. Öğrenciye bilgisayar ekranında kareli bir tablo veriliyor, aradada simetri ekseni var ve öğrenciler bu ekseni kullanarak diğer tarafta farklı renklerle boyanmış kareleri ortadaki simetri eksenine dayanarak diğer kısma simetriğini yapmaya calışıyorlar. Ama dediğim gibi bunu uygulayabilmek için teknolojinin nimetlerine ihtiyacımız var, ben sedece derste gördüğüm bu etkinliği sizinle paylaşmak istedim.
>
> Additionally, in the last week, our friends thaught symetry in the classroom. I learnt that there were good activities in the Internet. Indeed, Although they require some facilities [in the classroom], we can exhibite them to our students in a different form if we have a projector and a computer. A table with small squares on the computer, which is divided by a symmetry axis, was shown to students. The students' aim is to try to draw the colorful figures at the left side of the axis to the right. But as I said, to perform this activity, we need technology. I only want to share this activity with you, I have learned in the [our pre-service] course (S6, from METU, P4)



Incomparable experiences

Another student thought that it was not appropriate to compare the other courses with the PDC. Their experiences were completely different. He said,

> Aslında diğer derslerle kıyaslamayı uygun görmüyorum, çünkü çok farklı kulvarda ki deneyimlerimdi bunlar. Meslek öncesi dersler daha çok teoriye yönelik olduklarından MGÇ ortamında ki gibi uzun şekilde tartışma imkanımız olmadı tabi bir de diğer derslerde interneti kullanarak online tartışma yapma şansımız olmadı. Bu bağlamda, MGÇ deneyiminin bana kazandırdıkları çok farklıdır.
>
> In fact, it is not right to compare it with the other courses since they were my experiences from different points. Since the pre-service courses were more based on the theoretical information, we did not have the opportunity to discuss as we did in the PDC. In addition, we could not have chance to discuss in the other courses by using the Internet. In this case, the experiences I gained from the PDC are quite different (S5, from METU, R).

Table 4.7

What do they think about the effect of The PDC on their professional development when they compare it with other undergraduate courses?

	The universities			
	METU	COMU	AU	Total
Yes	11	7	6	24
No	-	-	2	2
No comment	-	1	1	2
Total	11	8	9	28
Their definitions of the courses taken before when compared with the PDC				
Theory based	3	3	-	6
Practice based	3	2	-	5
English based	1	-	-	1
Other courses	5	2	6	13
Contributions				
Being knowable about the practice	3	2	3	8
Having different perspectives	5	5	4	14
Beholding novel teachers' experiences	2	-	1	3
Not repeating faults in the videos	1	2	1	4
Visiting various teachers' classroom	2	1	-	3
Obtaining experience about new curriculum	2	1	2	5

The PDC's contributions

The participants' more detailed explanations are as follows,

Being knowledgable about the practice

Second mostly emphasized benefit of the PDC was obtaining practice in the field. The participants compared the PDC with the course 'school experience', which is the most similar course to the PDC. One of the participants explained how he benefited from the PDC,

> Daha önce aldığımız derslerde gerçek bir sınıf ortamını gördüğümüz ders olarak sadece 1. sınıfta aldığımız staj dersi vardı. O zaman daha yeni başladığımız için öğretmen olmanın tam olarak bilincinde değildik. Ve metod derslerini almadığımız için etkili bir şekilde gözlem yapamıyorduk. Bu seneki staj dersi içinde böyle bir şeyin olması çok iyi oldu bence. İzlediğimiz videoların yeni matematik müfredatına göre hazırlanmış

dersleri içermesi çok fazla gözlemini yapamadığımız şeyleri gözlememizi sağladı.

The only course that we took before and in which we viewed real classroom environments was the School Experience Course in the first year. In those days, since we just started [our university education], we were not aware of what it means to be a teacher. We could not observe effectively since we had not taken the methodology course. In my opinion, it was very beneficial to have this kind of lesson in our school experience course. The videos we watched, including prepared lessons in accordance with the new mathematics curriculum gave us the chance to observe the issues that we could not observe before (S4, from METU, I).

Comparing prior school experience with the PDC, he realized that the contribution of the PDC was more than the others since they were novels during their first experience. As a supporter opinion, S9 mentioned the contribution of the PDC on their professional knowledge with these words,

Bundan önce aldığımız dersler bizim teoriğimizi geliştirmek için yapılmıştı. Ancak öğretmen olunca pratiğe dökebileceğimiz yarar ve zararlarını o zaman anlayabileceğimiz derslerdi. Şimdi bu portal sayesinde pratikte bunların nasıl işlediklerini görmüş olduk. Teorikte kavrayamadığımız bir çok şeyi pratikte anlama şansıda bulduk.

The courses which we took before the PDC were designed to develop our theoretical background. They were lessons the benefits or negative points of which we can understand only when we start real teaching. Owing to this portal, we now saw how this theory was put into practice. We had the change to understand things when they were put in practice and that we didn't understand. (S9, from METU, R)

Another student took attention to the previous courses not including practical knowledge. Therefore, she claimed that the PDC is more beneficial since it addressed the importance of practice. She said,

Meslek öncesi derslerin geneli uygulamaya dönük dersler değildi ve bu da bana çok fazla katkı sağlamadı. MGÇ'de videoyu izleyip eksikleri tamamlamak ve yanlışları düzeltmek keyifliydi. Kendimiz bu dersi işlediğimizde nasıl planlama yapacağımızla ilgili konularda düşünmek, kendimizi dersi anlatan kişinin yerine koymak güzeldi. Hatta bazen staja gittiğim okulda ders anlatırken izlediğim videoların bana katkısı olduğunu fark ettim. Bu anlamda projeye katılmış olmamın artılarını görebiliyorum.

Generally, pre service courses were not practice based and they didn't contribute very much to me. It was enjoyable to watch the videos in the PDC to determine missing elements and to correct the mistakes [in activities]. It was good to put ourselves in the teachers' shoes, and to think about how to imagine ourselves planning the same lesson. I noticed that the videos, which we watched in the PDC environment, contributed to my development while I was teaching [as a student

> teacher]. In this sense, I can see pluses of taking part in the project (S14 from COMU, I).

Another student linked two benefits of the PDC, practical knowledge and obtaining new visions owing to the other participants,

> Daha önce aldığımız meslek öncesi dersler genelde teoriktir. Burada uygulamaya dönük bir çalışma görmekteyiz. Bu da öğrendiklerimizi uygulama aşamasında görmek ve başkalarının da düşüncelerini alarak bilgisayar ortamında tartışmak son derece etkili bir yöntem olduğunu düşünüyorum
>
> The pre-service courses that we took were generally theoretical. In the PDC environment, we can see practice-oriented study. I think that watching an application of the theory we learned and discussing it with others in a computer mediated environment is very effective method. (S19, from COMU, R)

Having different perspectives

14 out of 28 participants claimed that they obtained different perspectives owing to the PDC. According to them, professional sharing, which was essential for the PDC environment, made apparent individual differences among the participants. Owing to individual differences which were formed by university culture or their departmental diversity, they could obtain new ideas from the other university students. One AU students explained her idea as,

> Daha önce aldığım meslek öncesi derslerle MGÇ arasındaki en büyük fark farklı üniversite öğrencileriyle birlikte çalışmak oldu. Farklı görüşlere sahip olan öğrencilerle çalışmanın önemi tartışılmaz derecede büyüktü benim için. Bu bence bütün üniversiteli öğrencilerinin yapması gereken bir etkinlik olmalı.
>
> The main difference between the PDC and the pre-service courses which I took before was to study with the students from other universities. The importance of studying with other students having different perspectives was undeniable. I think that the PDC is an activity that all university students must use (S22, from AU, R).

In addition to reflection reports, two interviewees from different universities supported this idea,

> Geçen dönem güzeldi başta diğer üniversitelerden kişilerle bir şeyler paylaşmak daha farklı şeyler kattı bize. Çünkü zaten sınıftaki

arkadaşlarımla fikir alışverişi yapıyoruz. Bir yerden sonra hep aynı şeylerin üzerine yoğunlaşıyoruz. Farklı bir bakış açısı gerekiyordu.

The last term is good. Sharing something with other people who are in other universities has contributed different things to us. We already share our opinions with my classmates. We focus on the same ideas. Different views were essential. (S4, from METU, I)

Hocam başta şunu söylemek gerekiyor; bence, farklı üniversiteler ile çalışmak gerçekten çok güzel bir şey. Yani en azından bir arkadaşımız… Biz ODTU ile çalışıyoruz. Üniversiteleri küçük gördüğümden değil de gerçekten çok güzel bir şey. Sütçü İmam Üniversitesi de olsa aynı şey. Çok, ne bileyim farklı düşünceler, farklı. İnternet hatta bilgisayar çok güzel bir şey bence, bu yani. Taa neredeki insanlarla farklı deneyimlerle aynı zamanda, aynı yerde buluşabiliyorsunuz. Bu çok güzeldi

To begin with I want to say the followings. In my opinion, studying with different university students is very nice. At least a friend…. We worked together with METU students. I don't want to scorn other small universities. If it were Sütçü İmam University [which is a novel university in Turkey] it would have been the same. There were different ideas and thoughts. The Internet and computers are very effective tools. You can come together with people who had different experience at the same time and in the same place. This was very nice. (S26, from AU, I).

Beholding novel teachers' experience

Another benefit was beholding novel teachers' experiences. Some participants took attention to the video teachers. During the PDC activities, they had reviewed the class of one expert teacher and three teacher candidates. These participants claimed that investigating problematic behaviors or activities of young teachers in the videos directed them to realize what should do and what should not do in the classrooms.

Ayrıca izlediğimiz videolardaki öğretmenlerin son sınıf öğrencisi olması ileride ne gibi sorunlarla karşılaşabileceğimiz konusunda bize fikir verdi. Stajda gözlemlediğimiz öğretmenler genelde deneyimli olduğu için deneyimli olmayan öğretmenlerin ne gibi sorunlarla karşılaşabileceğini de görmüş olduk. Mesleki açıdan bana çok şey kazandırdığına inanıyorum.

…Moreover, the PDC gave us an idea about what kind of problems we may come across in the future because the teachers in the videos we watched were seniors. The teachers we observed in the School Experience course were generally expert teachers. Owing to the PDC, we could see what kind of problems inexperienced teachers may face. I believe that I gained lots of things for my profession. (S4, from METU, I).

Not repeating faults in videos,

Another benefit was 'not repeating the teachers' faults in videos. The participants said that instead of negatively criticizing video teachers, they had to learn not repeating the mistakes in videos.

For example, S11 explained her counter idea to another student who had harshly criticized the video teacher. To her, instead of these criticisms, they should have got experience from the video teachers' mistakes.

> Sonuçta hepimiz birer amatörüz ve zaman geçtikçe tecrübe kazanacağız, daha iyi olmak için uğraşacağız. Bunun için gördüğümüz olumsuz yanlardan ders çıkarıp bunları nasıl olumlulaştırabiliriz diye düşünmekte yarar var. Hani bekara koca boşamak kolaydır diye bir laf vardır ya; böyle oturduğumuz yerden bilgisayarın karşısında eleştirmek kolay. Bakalım biz ne yapacağız karşımızda 30 farklı çalışan beyinle karşılaşınca:))
>
> As a result, we were amateurs and we will gain experience over years. We will try to be better. Therefore, it is beneficial to gain experience from negative points of the activities [in the videos] and thus to think about how we can make them valuable. Similar to a Turkish idiom 'it is easy for a bachelor to divorce a woman' it is easy to criticize [the video teachers] by sitting in front of the computer. In the future, what will we do [in the real classrooms] when we come across with 30 different brains?:)) (S11, from METU, P4, p.10).

> Bence eksik yönleri de olsa bu etkinlik pek çok öğrenciye ulaştı. Videoyu izlerken öğrencilerin heyecanını hissedebildim. Kimileri gruplar kalabalık olmasına rağmen ters taraftan bakarak tangramı oluşturmaya çalışıyordu. Bunu bile sağlamış olmak çok güzel. Ben de Zeynep arkadaşım gibi tangramı ilk olarak üniversitede gördüm. Bütün bu koşulları düşündüğümüzde insanın çok olumsuz düşünesi gelmiyor. Ancak bu şekilde izledikten sonra eminim hepimiz daha güzel bir dersle bu konuyu anlatırız.
>
> In my opinion, even if the activity has some flaws it reached many students. While I was watching the video, I felt the students' enthusiasm. Even witness this enthusiasm is very nice. Just like Zeynep, I also learned tangram in the university education. When we consider these conditions, I don't think negatively. After watching the videos, I am sure that all of us will teach this topic more effectively in our lesson. (S9, from METU, P2, p.13).

Visiting various of teachers' classroom

During interviews, three participants appreciated teacher abundance in the videos when they compare them with their supervisor teachers which met owing the course "School Practice". Owing to the PDC, they had a chance of investigating various teachers'

classrooms although they had investigated only one or two teachers' classroom in school practice course.

Obtaining knowledge about new curriculum

After pilot application of new curriculum, which is based on constructivism, the new system was in its first year. Therefore, the participants have begun to learn new curriculum, yet. In this term, the students thought that the PDC gave an opportunity to obtain experience about the new curriculum. One student said,

> Öncelikle yeni ders müfredatına göre hazırlanmış dersi inceleme fırsatım oldu. Bu dersleri değerlendirirken eksiklikler ve güzel yapılan işleri bizzat canlı olarak sınıf ortamının da tanıklık etme şansı buldum.
>
> …First of all, I had an opportunity of examining activities being prepared according to new curriculum. When I evaluated these lessons, I have an opportunity to witness the flaw and good points of lessons in classroom environment. (S5, METU, R).

Negative opinions

According to some participants, the PDC made no contribution to their professional knowledge. One student determined her reason as group members not having competent skills. She believed that some important details which she overrated were omitted by the other participants. However, the general impression of this participant was completely positive about the PDC. In interviews she claimed that this environment should be used in both pre-service and in-service teacher education. She criticized one way of the PDC with following words,

> Ben çok fazla mesleki anlamda kendimi geliştirdiğimi düşünmüyorum, önem verdiğim ayrıntıların başkaları tarafından önemsenmeden yapıldığını gördüm, bu beni üzdü. Planın ilk şartı esnek olması ve uygulanabilir nitelikte olmasıdır. Ben bir çok arkadaşımızın uygulanabilir nitelikte plan hazırladığını düşünmüyorum, planda yer alması gerekenler konusunda belirli kalıplara bağlı kalındı değişimden ya da yeni bir şeylerden söz etmek neredeyse imkansız. Aldığım mesleki yeterliğin daha üstün ve benim için daha anlamlı olduğunu düşünüyorum.
>
> I do not think that I developed very well professionally. I observed that some details which are very important for me were omitted by others without any attention, and this made me upset. The first requirement of a lesson plan was to be flexible and applicable. I do not think that most of our friends prepared plans that

> are applicable. Contents of the plans were dependent on certain forms. It was almost impossible to mention about anything changed or new. I think that my prior professional qualification is superior and more meaningful. (S23, from AU, R).

The other student who stated activities in the PDC did not contribute to her professional knowledge, also explained some positive ways of the PDC with these words,

> Bilgisayar ortamında bilgi alışverişinde ve paylaşımda bulunacağımız bir dersimiz daha önce olmadı. MGÇ portalı bu açıdan iyiydi. Ancak bu ortamın benim mesleki gelişimime pek bir katkısı olmadığını düşünüyorum. Sadece değişik öğrenme etkinliklerini gördüm.

> We have never had a course that we could exchange and share knowledge in computer environment. In this point of view, the PDC was good. However, I think that this environment does not have much contribution to my professional development. I only saw different learning activities. (S21, from AU, R).

On the contrary, another student having positive ideas emphasized the importance of the real classroom in addition to videos in the PDC. He stated that the PDC would be more beneficial if it was used as supporter for all courses in addition to the school practice course.

> MGÇ deneyimi bizim aldığımız bir dersin sadece bir alt aşamasıydı eğer tamamı buna dayalı olsaydı beklediğimiz kadar verimli olamazdı. Bence pek çok ders için böyle bir uygulama yapılabilir ve faydalı da olur ancak tamamı buna dayandırılamaz. Çünkü sınıf ortamı bence çok daha önemlidir. Orada öğrencileri daha iyi gözlemleme şansı buluyorsun, iletişimin daha iyi oluyor çünkü sözcüklerin yanı sıra beden dilini de kullanmış oluyorsun. Bir dersin sadece bir ayağı bu şekilde uygulanırsa dersi daha faydalı kılar. Sınıf ortamında ders yapılması olmazsa olmaz bir koşuldur ancak teknolojini bu şekilde bir derse entegre edilmesi de önemlidir.

> The PDC was a sub part of the School Practice course which we took. If the course was completely depend on the PDC, it could not be as effective as we expected. To me, this kinf of application can be conducted for lots of courses and it can be helpful. However, all of the courses can not be depend on it. Because, to me, [real] classroom environment is much more important. In there, there is more effective observation chance. Your communication is also better since you can use body language in addition to words. That the PDC is applied as a supporter to other courses will make them more beneficial. Teaching lessons in real classroom environments are certainly a requirement but it is also important to integrate technology into a lesson in this way. (S2, from METU, R).

4.2.3. The PDC's potentials in professional development

Based on the PDC experience, the participants evaluated oCOP environments' potential in pre-service and in-service teacher education. In this part, the participants' perceived opinions were presented.

Pre-service education

After the fall term, 27 out of total 28 participants explained that they wanted to get involved in online environments which they can share the same environment with other pre-service teachers attending to other universities. While all of the students from COMU and METU found reasonable to come together with the other university students, only one student from AU had a diverse idea. The student said,

> …Hocam… bence bizim ders programımızda ders sayısının artırılmasına gerek yok. Öğretmenlik mesleği ile ilgili derslere ihtiyacımız var. Farklı üniversitelerden öğrenciler arasında bilgi aktarımıyla olmuyor. Daha uzman öğretmenlerin fikirlerine ihtiyacımız var. diğer öğrencilerin öğretmenlik uygulaması ile ilgili düşünceleri bana yeterli gelmiyor.
>
> To me, lesson count in pre-service teacher education should not be increased. Instead, new courses aiming to develop teaching profession should be offered. Information transmission among students from different universities does not achieve this aim. We need expert teachers' opinions. I don't believe that the other students' opinions on teaching practice will satisfy me. (S20, from AU, R).

Although this student was exceptional, he underlined one of the important needs of pre-service teachers. Pre-service teachers, as novels, need teaching experience since it is an important factor which will affect their future teaching life.

The other 27 participants would rather come together with other university students than being together with only their classmates. These pre-service teachers also explained the reasons for involving in oCoP environments, driving forces which made them to prefer such environments, and suggestions for these courses.

Reasons for involving in online community environments

The students put forth some reasons to explain why they preferred to get involved in a pre-service community. They stated that such environments would provide a) knowledge

and experience sharing among teacher candidates, b) to improve their professional knowledge, c) to obtain new horizons, d) to eliminate differences among universities, e) other benefits (profession love, social factors, completing deficiencies). Their explanations are presented in following paragraphs.

Most of the participants, 20 from three universities, focused that such environments provide knowledge and experience sharing. One of the students explained her idea as

> Başkalarıyla aynı ortamı paylaşabileceğim dersler almak isterim. Başkalarının fikirleri ve deneyimleri benim için önemli. Hem böyle ortamlarda kendi bilgilerimi de onlarla paylaşabilirim.
>
> I want to get courses in which we can share the same environment with other students. Their opinions and experiences are important for me. Besides, I can share my knowledge with them in such environments. (S21, from AU, R).

S21 appreciated other pre-services' experiences while another student explained the results of knowledge sharing. The student, in this sense, believed that people having different background will be beneficial for each other in these environments. When teacher candidates, with different cultures and so with opinions, come together, they have a big capacity which they light each other's ways. This is accomplished by knowledge sharing among these people.

> Evet isterim. Bu sayede heterojen bir grup oluşmuş olur. Farklı kültüre, farklı düşüncelere sahip insanların bir arada olması birbirlerini farklı açılardan aydınlatmaları, birbirlerine bir şeyler katmaları iyi sonuçlar doğuracaktır.
>
> Yes, I want. So, there will be a heterogenic group. That people having different cultures and opinions come together and light the others in different ways will provide knowledge sharing among these people. This accomplishes good outcomes. (Zeynep, from METU, R).

According to 11 participants, such environments improve teacher candidates' professional knowledge. One of them said,

> Örnek vermek gerekirse. Başka bir arkadaştan öğrendiğim her aktivite ileride sahip olacağım öğrencilerimin bilgilerinin kalıcı olmasına katkı sağlayabilir. Aslında bu sayede benim bilgilerim gelişecektir. Bu sadece küçük bir örnek olmasına rağmen böyle ortamların katkısını göstermede büyük önemi olduğunu düşünüyorum.

> … For example, any activity which I learned from a teacher candidate can be beneficial to increase the permanency of my future students' knowledge. Indeed, my professional knowledge can be improved owing to the environment. Although this can be a small example to show benefits from this environment, I believe in that it has a big importance to show contributions of such environments. (S22, from AU, R).

The student believed that she could benefit from other pre-service teachers' opinions since their opinions would contribute her professional knowledge. Another student accepted that such environments would cause professional development since she could learn new knowledge from the others. Indeed, to them, this new knowledge comes from the students' cultural diversity.

> Evet böyle dersler almak isterim. Sonuç olarak her üniversitedeki her bir hoca aynı konuyu farklı yanlarıyla işleyebilir. Bu farklılıkları ben şahsen başka üniversitelerin eğitim fakültelerindeki tanıdıklarım aracılığıyla öğrenmeye çalışıyordum. Eğer böyle bir ders alırsak bu farklılıklar sayesinde pek çok yeni şey öğrenebiliriz.
>
> Yes, I want to get such courses. As a result, every teacher educator in different universities touches on different point of the same topic. Personally, I should have tried to learn these differences owing to my friends from other universities. If we get such courses, we can learn lots of new things related to our profession owing to our differences. (S9, from METU, R).

Further, some opinions underlined that such courses opened a new horizon. Four opinions from METU students were about this reason. One student explained,

> Çünkü farklı üniversitede ki öğretmen adaylarının da yapılan yenilikler ve uygulamalar hakkında fikirlerini öğrenmek bakış açımı geliştirirdi diye düşünüyorum. Sonuçta aynı üniversiteden arkadaşlarımızla paylaştıklarımız sınırlı kalıyor. Bunda ki en büyük etken aynı dersleri aynı hocadan almış olmamız ve benzer bir bakış açısına sahip oluşumuzdur.
>
> I believe that my viewpoint is going to be developed if I can learn new applications and opinions from teacher candidates from different universities. The sharing among the same university students was limited. The biggest factor is that we had taken the same courses from the same instructors and we have the same views. (S17, from COMU, R)

Two opinions were about eliminating differences in their education. One student explained as

> Tabi ki almak isterim. Gerçi almak istememek kendini dış dünyaya kapatmak olur. Sonuçta öğretmen olduğumuzda kendi okulumuzda öğretmenlerle çalışmayacağız. Farklı okuldan farklı eğitim almış öğretmenlerle aynı ortamda çalışacağız. Farklı eğitimden kastım sürekli bize söylenen odtü öğrencisi olmanın farkını fark edeceğiz. Belki de çok farklı olmadığımızı göreceğiz veya eksiklerimizi tamamlamak için fırsat bulmuş olacağız.
>
> Of course, I want to get. The reverse means that we live in a closed box. [in the future] we will work with teachers working in different schools and getting different education. My purpose to say 'different education' is that we will feel the diversity of being METU student after graduation, which is said to us continuously. Contrary, may be, we will understand that there isn't any difference among us. So, we find ways to complete our deficiency. (Mustafa, from METU, R).

This student believed that being a METU student was an advantage. Therefore, the other students could benefit from them. The similar opinions can be seen in opinion of the students from COMU. Two students said that they wondered education given at METU.

Further, some opinions underlined were enjoying their profession and social factors. A student explained that she want to be involved in these courses because of her love to the profession. Even, another student explained that they prefer such environments since they provide more social environment to meet with other people.

Driving forces affecting the participants' ideas

The participants presented some driving forces affecting their ideas on oCoP environments' potential in pre-service teacher education. These are a) differences among students from different universities (because of academician difference and university opportunities) b) the same evaluation process after graduation c) life-long learning, d) desire to know the other university students' education, and e) changing curriculum.

Almost all students believed that there were some differences among different university students. These were because of both academician differences and university opportunities. 12 opinions supported this driving force. Related to differences among students from different universities, a student said that

> Hepimiz aynı bölümde olsak bile diğer üniversitelerle bizim eğitimimiz aynı olmadığı için onlarla öğretmenlik mesleği ile ilgili dersler almak isterim. Hepimiz aynı eğitimi almışız gibi değerlendirileceğiz. Farklılığa sebep olan çok fazla neden var aslında akademisyen farklı, veya üniversitelerin imkanları farklı…

> I want to get such courses in which we can share the same environment with other university students because our education does not match with education of the others although all of us are attending the same department. We will be evaluted as if we have the same education. There are lots of reasons for differences; academicians' different perspectives or opportunities of universities. (Gulsah, from COMU, R).

This was an example for mostly emphasized issue by students. After differences, another mostly emphasized driving force was related to life long learning needs. The students believed that they had to develop themselves during all their life. Therefore, they need other peers.

> Elbette meslektaşlarımla aynı ortamı paylaşabileceğim dersleri almak isterim. Çünkü bir birey ister öğretmen olsun isterse normal bir vatandaş daima kendimizi yetiştirmek zorundayız. Her alanda bilgi sahibi olmalı, araştırmalı ve kendimizi en iyi şekilde hayata hazırlamalıyız. Zaman o kadar hızlı akıp gidiyor ki yetişemesek bile elimizden geleni yapmalı daima yeni görüşlere açık olmalı, bilgimizi diğer insanlarla paylaşmalıyız. Özellikle meslektaşlarımızla bilgi alışverişinde bulunmalı ve onların deneyimlerinden faydalanmalıyız.

> Of course, I want to get the courses in which I can share with my peers. Because, either being a teacher or a normal citizen we have to develop our selves. We have to be sophisticated, to explore and to make ready for the life. The time is passing fast. Therefore, we have to be liberal and share our knowledge with others even if we followed the time. Especially, we should be in communication with our peers and we should benefit their experiences. (S18, from COMU, R).

Another student emphasized that changing curriculum required new professional development and new information related to curriculum;

> Diğer üniversitelerden olan öğrencilerle ortak dersler almak isterim. Çünkü bu sayede sadece ODTÜ öğrencilerinin değil diğer üniversite öğrencilerinin de görüşlerini, tecrübelerini görme imkanı bulmuş olacağım. Artık biliyoruz ki önümüzdeki yıl K- 8 müfredatı değişiyor ve yeni matematik müfredatı yapısalcı (constructivist) yöntem çerçevesinde öğrencilere bilgileri doğrudan vermek yerine onların keşfetmelerini sağlayacak, ezberci anlayıştan uzak oyun havası içinde eğitici etkinliklerden oluşacak. Bunun için de kendimizi geliştirmek, öğrencilere daha faydalı olmak için sadece ODTÜ öğrencilerinin değil diğer üniversitelerden olan öğrencilerin de çalışmalarına, etkinliklerine ihtiyaç duyacağımız kanısındayım. Sadece etkinlik boyutuyla değil sınıf yönetimi gibi konuların işlendiği öğretmenlik mesleğiyle ilgili diğer dersleri de bu şekilde almak isterim.

> I want to take partner courses with other university students. So, I can see not only METU students' opinions but also other university students'. Anymore, we know that K-12 curriculum will change in the next year, and new curriculum will

> compose of instructional activities aiming students to discover and construct new knowledge in a game environment instead of rote learning. Therefore, I belive that we have to develop our selves and we will need other university students' activities and works to be usefull to children. I want to take other courses in this way [in the PDC] such as classroom management in addition to activity based courses. (S2, from METU, R).

Suggestions

The students also made some suggestions for such environments. These are a) it can be with students from different countries, b) courses including conclusion; c) it can be with students from the same field.

Mostly emphasized suggestion was that such environment should include pre-services from the same field. One student explained her ideas as

> Ayrıca farklı üniversitelerden aynı dersi alacak öğrencilerin bölümleri de aynı olmalı bence. Çünkü her öğrencinin kendi alanıyla ilgili söyleyebileceği daha fazla fikri var. Yani, bizim bölüm öğrencileri sınıf öğretmenlerine gore daha bilgili. ikimiz de matematik öğretsek bile
>
> …In my opinion, the department of students from different universities should be the same since every student have more words on his/her own field. For example, students from elementary mathematics education have more critical thinking about her/his own field more than a student from primary education although both of them teach mathematics. (S7, from METU, R).

Another issue emphasized was the content of the course. One student suggested that if an environment had been designed for oCoP, the most important selection criteria should have been the content. To him, its content should include commentary information.

> Hocam, elbetteki dersin içeriği çok önemli. Yorum yapabileceğimiz ya da birlikte çalışabileğimiz dersler olması çok önemli.
>
> Of course the content of the course is also important. Especially, courses in which we can conclude or move collaboratively should be gotten. (S3, from METU, R).

Another student stressed that it could be more beneficial if such environments were offered for students from different countries. Finally, another student from COMU proposed that such environments should be supported face to face sessions.

Table 4. 4.

How do they evaluate the benefits of oCoP in pre-service teacher education?

	The Universities			
	AU	METU	COMU	Total
Answer				
Yes, I want	8	11	8	27
No, I do not want	1	-	-	1
Reasons				
Sharing knowledge and experience	8	7	5	20
Improving their professional knowledge	3	4	4	11
Creating new perspectives	-	4	-	4
Eliminating differences	-	1	2	3
Others (enjoying their profession and social factors	2	1	-	3
Driving forces				
Differences among students from different universities	4	5	3	12
Academician difference	1	1	2	4
University opportunities	-	-	2	2
The same evaluation criteria after graduation	-	-	1	1
Life-long learning	1	-	3	4
Changing curriculum	-	2	-	2
Suggestions				
It should be face-to-face	-	-	1	1
It can be with students from different countries	-	3	-	3
Such courses should include conclusion	-	1	-	1
It can be with students from the same field	-	4	-	4

In-service education

The participants showed interest to get involved in environments after graduating in which they can share experience with other in-service teachers. The participants explained the reasons of why they want to get involved in such environments and driving forces which help to make decision on potential of oCoP environment in in-service education.

Reasons for involving in online community environments

The participants presented their reasons for involving in environments aiming to compose a community as a) to overcome problems in a teacher' life, b) knowledge sharing, c) for professional development, and d) to access and use available and free course materials

The mostly emphasized issue (19 of them) was that such environments may provide knowledge sharing among members of it. They exemplified knowledge types which would

be shared in these environments as new developments related to profession, their peers' different materials and experiences and problems and solutions to them.

One student commented that such environments are beneficial for all teachers, because after graduation, teacher collaboration would be more important. She said,

> …Bu [bilgi alışverişi] hem öğrenciyken hem de uygulama aşamasında çok önemli. Hatta uygulama aşamasında çok daha önemli olduğunu düşünüyorum. Çünkü şu anda üst düzeyde bilgi birikimine sahip hocalarımızdan bir çok bilgiler almaktayız. Mezun olduğumuzda sadece kendimiz bir şeyler yapmaya çalışacağız ve de çoğumuz aslında çok bilgi sahibi olamadan meslek yaşamımızı sürdürüyor olacağız. Böyle etkinliklere katılarak ki özellikle uygulamayla ilgili düşüncelerin tartışıldığı bir platformun, kesinlikle çok büyük yararları olacaktır.

> …Knowledge sharing is very important both during university education and after graduation. Indeed, I believed that it is more important in practice because today we can obtain information from our instructors having upper level field knowledge. After graduation, we will be lonely and try to do something as alone teachers. Indeed, most of us continue teaching without not knowing much. By participating in such environments, the platforms in which practical ideas is discussed will be very beneficial. (S22, from AU, R).

Another student gave an online community example to explain why he accepted to participate in such environments. It can be seen from his words that some teachers are already accessing such learning communities.

> Evet, isterim; sebeplerine gelince öncelikle karşılıklı bilgi ve fikir alışverişi bence öğretmenlerin her daim uygulaması gereken bir mevzu. Üyesi olduğum bir forum grubu var Amerika tabanlı ama isteyen herkes üye olabiliyor. Burada öğretmenler karşılaştıkları sorunları Dr. Math denen kişiye soruyorlar ve Dr. Math onlara yardımcı olmaya çalışıyor. Bende ara ara bu siteye girip karşılıklı yaşanan konuşmaları takip ediyorum ve şimdiden ileride yaşayabileceğim sorunlara yönelik kendime bir klasör hazırlıyorum. Dolayısıyla böyle bir ortamın ülkemizde de olması gerçekten öğretmenler için çok yararlı olabilir.

> Yes, I want. Firstly, mutual knowledge and opinion sharing is a topic which all teachers should make. There is a forum from USA, in which anyone wanting to participate can participate. I am a member of this community. in this environment, teacher is asking the problems they face to Dr. Math and then Dr. Math replies their answers. I sometimes log in the site, follow mutual conversations and prepare a folder for possible problems which I can live in the future. Therefore, such a communication groups also being in our country can be beneficial for other teachers. (S3, from METU, R).

One of the mostly emphasized issues was to overcome problems in a teacher' life. 17 opinions supported this item. Pre-service teachers believe in that they would have some

kinds of problems at schools since they are unexperienced. The problems could be related to their students or parents. Therefore, they believe that if they participate in such environments they would discuss about their problems and find some solutions to them.

The pre-service teachers also emphasized that they can prefer such environments since such environments would make the profession easy and develop professional life owing to mutual interaction. 12 opinions supported this reasons.

Finally, they said that they would obtain different course materials through these environments. Four opinions supported this reason. One of the students explained his ideas by giving an example,

> Bizden bazı durumlarda okul idaresi tafarından anlık, bazı özel günlere yönelik etkinlikler istenebilir (sadece matematik dersinde uygulanan etkinlikleri kasdetmiyorum) Mesela, diyelim 10 Kasım yaklaşıyor ve okul idaresi bizden Atatürk ve Matematik konulu bir çalışma hazırlamamızı istiyor. Kendi çalışmalarımızla elbette güzel bir çalışma ortaya çıkarabiliriz ancak eğer bu gibi konularda meslektaşlarımızın da fikirlerine başvurursak daha anlamlı ve etkili bir çalışma ortaya çıkarabiliriz.
>
> In some situations, the school board can request us some instant activities in accordance with a special day (I didn't mean only mathematical activities). For example, the school board can want to prepare a work about Ataturk and mathematics before November, 10. In these days, we, of course, can produce a good material. However, if we can consult other peers' opinions, more meaningful and effective materials can be created. (S2, from METU, R).

From the interviews, one participant stated that if teachers had had an opportunity of comparing themselves with other teachers they would have realized their deficiencies in their teaching life. She said,

> …Hizmet sonrası öğretmenler için şöyle yararlı olabilir hocam. Birincisi o videodaki görüntüler ile kendi sınıflarını kıyaslayabilirler hocam. Mesela şu anda uygulamaya gidiyoruz hocam. Bazı öğretmenler kendi sınıflarının mükemmel olduklarını düşünüyorlar. Çünkü farklı bir yerde ya da o zaman zarfında başka bir sınıfa gidip de görev yapmadıklarından kaynaklanıyor. Videolarım işte bu yani. Kendi sınıflarıyla o sınıfları kıyaslayabilirler ve kendi deneyimleri ile karşıdaki öğretmenlerin deneyimlerini kıyaslayabilirler….İşte videolarda eski öğretmenler ile yeni öğretmenler, geleneksel öğretmenler ile yapılandırmacı öğretmenler. Çünkü o videolarda yapılandırmacı daha doğrusu öğrenciyi aktif kılan etkinlikler vardı. Ama gelenekselde… çünkü bizde gidiyoruz hocam öğretmen anlatıyor. Ne kadar ben uyguluyorum dese de anlatıyor geçiyor. O yüzden öğretmene öncelikle kendi yeterlikleri görmesi, sınıfı kıyaslaması, sınıfındaki öğrencileri kıyaslaması açısından iyi.
>
> Benefits for in-service teacher can be such. Firstly, they can compare the video classroom with their own classroom. For example, we are going to practice schools. Some of the teachers think that their classroom is wonderfull. Because, they didn't

> teach in a different place. [Owing to the PDC], they can compare their own classroom with the video classes and their own experiences with other teachers' experiences. In the videos, former teachers with novel teachers and traditional teachers with constructivist teachers. Because, in the videos there were constructivits activities- in other words, the activities which make students more active. However in traditional education…. Because, we are going to [the practice schools]. The teachers are only mentioning. Although she/she says that I performed [the new curriculum], she/he only mentions. Therefore, [the videos] are beneficial to show their own qualifications to teachers and to compare their classes. (S26, from AU, I).

Another student from METU supported the above student on especially related to the new curriculum. She said,

> Bir çok insan yeni müfredatın konu olarak nasıl olduğunu bilmiyor. Eski öğretmenler özellikle. Hani bir şeyler yazılı olarak var ama bunlar yapılmaz diyerek geçiyorlar. Staja gittiğim okullarda da bunu görüyorum. Hani kağıt üzerinde var ama biz bunu seneye de uygulamayız. Kendi bildiğimiz şekilde anlatırız diyorlar. Anlatılabileceğine inanmıyorlar… Uygulanmış hallerini görürlerse belki onlar için daha ikna edici olabilir.

> Lots of people, especially old teachers, do not know the new curriculum. There is something as written but the teachers don't interest them by saying them being impracticable. I observed this situation in the school which I went for school experience course. [The teachers said that] they would not put into practice [this curriculum] in the next year, and they mentioned lessons in their own way. [In my opinion,] it can be more convincing if they can observe the activities in practice. (S4, from METU, I).

Driving forces affecting the participants' ideas

The participants presented driving forces affecting their ideas on oCoP environments. These are a) experience differences among teachers, b) new generation, c) technological advancements, d) changing curriculum, e) being researcher teacher and f) being isolated in different locations of Turkey.

Mostly, the students believe that there were experience differences among teachers. While some teachers, similar to them, are novels, there were teachers who are experts in the profession. That was because of experience differences and these teachers must have come together. One of the participants said,

> Belkide acemiliğimiz yüzünden büyük problemlerimiz olacak. Yani, eğer kendimiz üstesinden gelemezsek [internet ortamında] deneyimli öğretmenlere sorabiliriz.

> May be, because of novelty we will have big problems. So, if we don't overcome the problems we can consult expert teachers [in online environments]. (S23, from AU, R).

After experience differences, another mostly emphasized driving force was being isolated in different regions of Turkey. The students who touch on the issue believed that being in different locations of Turkey would be a disadvantage for them. Therefore, they would need such environments.

> Mesleğe başladığımızda eğer Milli Eğitim'de görev alacaksak hepimiz Türkiye'nin farklı bölgelerinde olacağız. Belki tecrübesizlikten kaynaklanan sorunlarımız olacak (Büyük olasılıkla ☺) ve biz bu sorunların üstesinden gelemediğimizde aynı durumdaki daha tecrübeli meslektaşlarımızdan [bu ortama benzer online ortamlarda] destek alabileceğiz. Bu anlamda güzel paylaşımlar olabilecek. Öğrencilik yıllarımızda arkadaşlarımıza veya hocalarımıza danışırdık.

> At the beginning of the professional life -if we work in MNE- we are going to be separated in different regions of the Turkey. We will have problems arising from our novelty (most probably☺). So, in these days, when we couldn't overcome these problems we can take support from more expert peers [in this type of online environments]. In this mean, good sharing will be accomplished. During undergraduate years, we generally consulted to our instructors, our friends in the same department. (S14, from COMU, I).

Another issue was related to new generation. The participants emphasized the trends of new generation. One of them mentioned the role of teachers,

> Bence yeni çağ öğretmenlerin mesleki gelişimlerini sürekli kılmaktadır. Mevcut bilgileri üzerine bilgi katmalı ve diğer öğretmenlerle bir iletişim içerisinde olmalılar.

> I believed that new generation requires that teachers have to refresh their professional knowledge all time. They have to add new knowledge on their available knowledge, communicate with the other peers. (S12, from COMU, R).

Table 4.8

How do they evaluate the benefits of oCoP environments in-service teacher education?

	The Universities			
	AU	METU	COMU	Total
Answer				
Yes, I want	9	11	8	28
No, I do not want	-	-	-	-
Reasons				
Overcoming to problems	6	7	5	17
knowledge sharing	7	8	5	18
Professional development	5	4	3	12
Access and use available course materials	2	2	-	4
Comparing themselves with others	1	2	3	6
Driving forces				
Experience differences	1	4	3	8
New generation	1	-	2	3
Technological advance	1	-	1	2
Curriculum change	2	2		4
Being researcher teacher	-	-	1	1
Being isolated in different locations	1	3	3	7

4.2.4. Summary

First research question was about how pre-service teachers evaluated their oCoP experience. So, the participants' general impressions about the PDC, the PDC's contributions on their PD, the PDC's potentials for pre-service and in-service teacher education were investigated in more detail. The results of the question are summarized in Table 4.9.

The participants' general impressions toward the PDC were positive. They claimed that the PDC was entertaining, flexible, enjoyable, pleasant, interesting, beneficial, activating, different and effective. On the other hand, there were two negative ideas; first one was that the environment has been very demanding for them. Secondly, mandatory participation affected some of the participants' opinions negatively. Moreover, there were some students whose impressions have changed at the middle of the term after they legitimized the PDC. In the beginning, they said that they had been prejudiced because of its obscurity.

Another evaluation criterion is the PDC's contributions to the participants' PD. They said that the learning environment contributed to their PD because they obtained different perspectives, practiced, got information about various grade levels, experienced with new curriculum, learned not to repeat mistakes in videos and beholded novel teachers'

experiences. The most emphasized topic among these contributions and benefits was obtaining different perspectives and practicing opportunity.

Except for one student, all participants wanted to be involved in oCoP which they could share with other pre-service teachers attending other universities. They said that such environments would provide knowledge and experience sharing among its members, contributed pre-service teachers' professional knowledge and their members would get new perspectives. Furthermore, differences, which are because of university and academician differences, can be elimitated owing to these kinds of environments. The most underlined benefit among these issues has been that these environments provided knowledge and experience sharing. In addition to the benefits, the participants stated some daily life trends which caused to be claimed above benefits. These driving forces are differences among students, lifelong learning, changing curriculum, and the same evaluation criteria after graduation although pre-service teachers have not the same education in their universities. The most frequently emphasizing driving force has been differences among pre-service teachers.

All participants wanted to be involved in oCoP environments, which they could share with other in-service teachers, after they graduated. They stated that such environments would guarantee knowledge sharing and make their professional life easier. Furthermore, owing to these environments, they would overcome educational problems placed in a teacher' daily life, get opportunity of comparing themselves with other teachers and obtain free course materials available. The mostly stressed benefit has been knowledge and experience sharing. In addition to the benefits, the participants stated some daily life trends which caused to be claimed above benefits. The driving forces were experience differences among in-service teachers, being separated in different region of the country after graduation, curriculum change, new age, technological advancements and being researcher teacher. The most emphasized driving force has been experience difference among in-service teachers.

Table 4.9

General summary of the research question 1

Issues	**Results**
General impression	The participants' impressions, Positive: 85.71%, Negative: 14.29 %
	➢ The participants generally defined the PDC as entertaining, flexible, pleasant, interesting, beneficial, activating, different, effective, encouraging different views and provising time and place mobility.

	➢ Negative points of the PDC were "demanding environment" and "mandatory participation". ➢ There were some participants whose impressions have changed in the middle of the term after they legitimized the PDC. They said that in the beginning, they were some prejudiced because of its obscurity.
Contributions to professional development	Most of the participants believed that their professional knowledge developed owing to the PDC. Yes: 96.00%, No : 4.00% Limitation of face to face undergraduate courses was that they included only "theoretical knowledge". Theoretical knowledge obtained from other face to face courses has been a base for the PDC and made it easy to produce comments in the discussion list. The participants transferred their theoretical knowledge to the PDC environment. The participants shared their practical knowledge which they learnt in their regular face to face classes in the PDC environment. The participants said that PDC contributed to their professional development. They obtained different perspectives, practiced, experienced with new curriculum and got an opportunity of visiting more teachers' classrooms. Furthermore, the participants stated that they experienced with various grade levels, learned to not repeat mistakes in the videos and beholded novel teachers' experiences. In detail, these contributions and benefits are as follows, ➢ Being from different universities and, thus, cultures enabled the participants obtain different views. ➢ Practical knowledge obtained from the real life examples in the videos significantly contributed to the pre-service teachers' future teaching life. ➢ The participants obtained the opportunity of learning new applications of the MNE (new curriculum). ➢ By emphasizing the number of videos, the participants claimed that they had a chance of meeting more teachers' classes in the PDC although in their practice course they had visited only a few

	teachers' classes. ➢ They experienced with flaws of the activities in the videos. ➢ In addition to expert teachers, in the videos watched or practice course, the participants experienced with student teachers', who are graduated 1 year before the participants, teaching practices. Negative ideas were exceptional. ➢ One participant, who had positive impression about the potential of the PDC in teacher professional development believed that the PDC did not make any contribution to her since she felt more qualified than the others in the PDC. ➢ The other participant stated that she only learned different learning activities from the PDC and she believed that they were not so important.
Potential benefits of the PDC for <u>pre-service</u> education	Except for one participant, all of them emhasized the importance of oCoP environments in pre-service teacher education. ➢ This exceptional participant paid attention to the need of more experience teachers' opinions. The participants determined some potential benefits of oCoP environments for pre-service teacher education. These were knowledge and experience sharing, developing professionally, obtaining new views, eliminating differences among universities and other reasons (professional love and completing deficiencies). In detail, these benefits are follows, ➢ The participants believed that oCoP environments would provide knowledge and experience sharing among its members. ➢ As discussed prior title, oCoP environments contribute pre-service teachers' PD. ➢ They can obtain different perpectives since every member in an oCoP environment have a different perpective. ➢ Differences among pre-service teachers from different universities can be eliminated owing to oCoP environments. ➢ Additionally, professional love and completing deficiencies has been other reasons to prefer such environments. The driving reasons which forces the participants to participate in these learning environments are differences among pre-service teachers from

	different university because of both academician differences and university opportunities), the same evaluation process after graduation although pre-service teachers from different universities have different education, the importance of lifelong learning in teaching profession, desire to know the other university students' education and chaning curriculum.
Potential benefits of the PDC for in-service teacher education	All participants emphasized the importance of oCoP environments in teachers' professional development. The participants determined some potential contributions and benefits for in-service teachers. They believed that owing to oCoP environments, teachers would overcome educational problems, share knowledge and experience, make professional life easier and obtain free course materials available. In detail, these benefits are follows, ➢ In their daily life, in-service teachers faced with some educational problems of children. The participants thought that owing to oCoP environments, teachers coming together could solve these problems with the help of other teachers. ➢ In addition to educational problems, the participants said that teacher, in these environments, would share knowledge and experience among its members. ➢ As a result of coming together, teachers make their professional life easier. ➢ The library composed from oCoP members gives an opportunity of obtaining free course materials available. The participants stated some forcing reasons to participate in these learning environments related to after graduation. These driving forces are experience difference among teachers, new age, technological advancements, changing curriculum, being researcher teacher and being separated in different locations of the country.

4.3. Behaviors of the participants in the PDC

4.3.1. Message traffic

At the end of the four periods there were 186 messages from all of the participants, indicating that average 46.5 messages were sent in each term. For the first period, since AU students were exempt to send messages, the other two universities sent 50 messages totally and average message per student was 2.63. In the second period, there were 56 messages from AU and METU students while COMU students were not responsible to sent messages. The average message for second period was 2.8 per student. When we examined the third period there were 34 messages from COMU and AU students while it was 2 per student in average. In the last period, the count of messages which were sent to the discussion list by METU and COMU students were 46, in average it was 2.42 per student excluding AU students since they were responsible to send lesson plan in this period. Taken together all these data showed that there were 9.85 messages per student and 2.46 messages per student per period.

In the beginning, we examined the message numbers within groups. In the case of METU students, there were 2.81, 3 and 3 messages per student from METU in first, second and fourth periods, respectively. At the end of the four periods there were 98 messages indicating 8.81 messages per student. METU students were not responsible for sending any messages during the third period. When we examined the average messages per period and average message per student per period, we observed that the participants sent 32 messages per period and each student sent 2.9 messages per period.

When we examined COMU students, there were 2.37, 2.12 and 1.63 messages per student from COMU in first, third and fourth periods, respectively. At the end of the four periods there were 49 messages indicating 6.12 messages per student. When we examined the average messages per period and average message per student per period, we observed that the participants sent 15.98 messages per period and each student sent 2 messages per period. COMU students were not responsible for sending any messages during the second period. 6 out of 8 participants sent their lesson plan in the second term.

Examining AU students' data showed that there were 2.44 and 1.88 messages per student from AU in second and third periods, respectively. At the end of the four periods there were 39 messages indicating 4.33 messages per student. When we examined the average messages per period and average message per student per period, we observed that the participants sent 19.5 messages per period and each student sent 2.16 messages per period. AU students were not responsible for sending any messages during the first and

fourth period. All the participants for the first term but 7 out of 9 participants for the fourth period sent their lesson plan.

On the other hand, when we compared the data between groups, it was observed that the average messages per student were higher for METU than COMU which is higher than AU. There were an increase in average number of messages per student in METU students while a decrease in COMU and AU students have been observed in following periods.

Table 4.10

E-mail counts according to periods and the universities.

The Universities	Student No	Gender	PERIODS 1st	2nd	3rd	4th	Total 1	Average 1
METU	1	M	3	3	LP	3	9	3
	2	M	3	3	LP	2	8	2.66
	3	F	2	4	LP	4	10	3.33
	4	M	3	3	LP	3	9	3
	5	F	3	3	LP	3	9	3
	6	F	3	3	LP	3	9	3
	7	M	2	3	LP	3	8	2.66
	8	F	4	4	LP	2	10	3.33
	9	M	2	1	LP	4	7	2
	10	F	3	4	LP	3	10	3.33
	11	F	3	3	LP	3	9	3
		Total 2	31	34	-	33	98	32
		Average 2	~2.81	3	-	3	8.81	**2.9**
COMU	12	F	3	LP	3	3	9	3
	13	F	1	LP	2	1	4	1.33
	14	F	3	LP	3	3	9	3
	15	F	3	LP	4	1	8	2.66
	16	F	3	-	1	2	6	2
	17	M	2	-	-	-	2	0.33
	18	F	2	LP	2	1	5	1.66
	19	F	2	LP	2	2	6	2
		Total 2	19	-	17	13	49	15.98
		Average 2	2.37	-	2.12	1.63	6.12	**2**
AU	20	M	LP	3	3	-	6	3
	21	F	LP	1	2	LP	3	1.5
	22	F	LP	1	-	LP	1	0.5
	23	F	LP	3	3	LP	6	3
	24	M	LP	1	2	LP	3	1.5
	25	F	LP	2	1	-	3	1.5
	26	F	LP	5	3	LP	8	4
	27	F	LP	3	2	LP	5	2.5
	28	F	LP	3	1	LP	4	2
		Total 2	-	22	17	-	39	19.5
		Average 2	-	2.44	1.88	-	4.33	**2.16**
	General Total		**50**	**56**	**34**	**46**	**186**	**23.25**
	General Average		**2.63**	**2.8**	**2**	**2.42**	**9.85**	**2.20**

LP. Lesson Plan

Based on the participants (for rows)

Total 1. Total message counts for per student

Average 1. Average message count for per student

Based on the periods (for columns)

Total 2. Total message count for each period according to universities

Average 2. Average message count for each period according to universities

General Total. Total message count for each period

General Average. Message mean, per student per period

4.3.2. Content analysis of e-mail messages

Discussion list messages were analyzed based on their word count. This information gives an evidence to understand complexity of the messages since the size of the messages may directly related to the complexity of an e-mail (Barab, 2004; Hawkes & Romiszowski, 2001, Khan, 2005). As seen in the Table 4.11, there are three types of participants. "The students" show the preservice teachers who are responsible to send comments related to the videos. "The other people" include the instructors, in service teachers who participated to the study voluntarily and the researcher. "The lesson plan" shows teacher candidates who are responsible to send lesson plan. Being some messages coming from these participants showed that there were some participants who sent extra mails.

Table 4.11

E-mail word count according to periods and participants.

Periods	Participants	Mean	Std. Dev.	Min	Max	N
First	student	116.8	64.9	34	281	50
	the other	100.7	54.1	12	166	13
	lesson plan	73.0	-	-	-	1
	Total	112.9	62.5	12	166	64
Second	student	126.2	63.6	32	310	56
	the other	201.5	168.9	82	321	2
	Total	128.8	67.8	32	321	58
Third	student	82.0	41.4	30	240	29
	the other	68.5	42.3	34	123	4
	Total	80.3	41.0	30	240	33
Fourth	student	119.8	58.9	43	373	43
	the other	115.5	123.7	28	203	2
	Total	119.6	60.5	28	373	45
Total	student	114.8	61.2	30	373	178
	the other	105.6	73.7	12	321	21
	lesson plan	73.0	-	-	-	1
	Total	113.6	62.4	12	373	200

The participants sent the most complex messages in the second period. Third period was the lowest discussion period in which the discussions took flame. In the fourth period, the discussions' complexity increased. When the other people' messages are investigated, they were active especially in the second period similar to the participants. Furthermore, it

can be seen that the participants who are responsible to send Lesson Plan also sent e-mails in the first and fourth periods. According to periods, how the mean of the word counts is changed can be seen in Table 4.12.

4.3.3. Hours the e-mails sent

The e-mails were explored based on which part of a day they were sent. The parts of a day were determined as morning (06-12 am), afternoon (12-18 pm), evening (18-0.00 pm) and night (0.00-06 am). This information help to understand which part of a day the participants preferred to contribute to an online CoP.

When the results were investigated it is clear that the participants preferred to send e-mails in the evenings (Table 4.12). In the first, second and fourth periods the participants sent e-mails generally in the evenings while in third period they mostly sent their e-mails in afternoons (Figure 4.2).

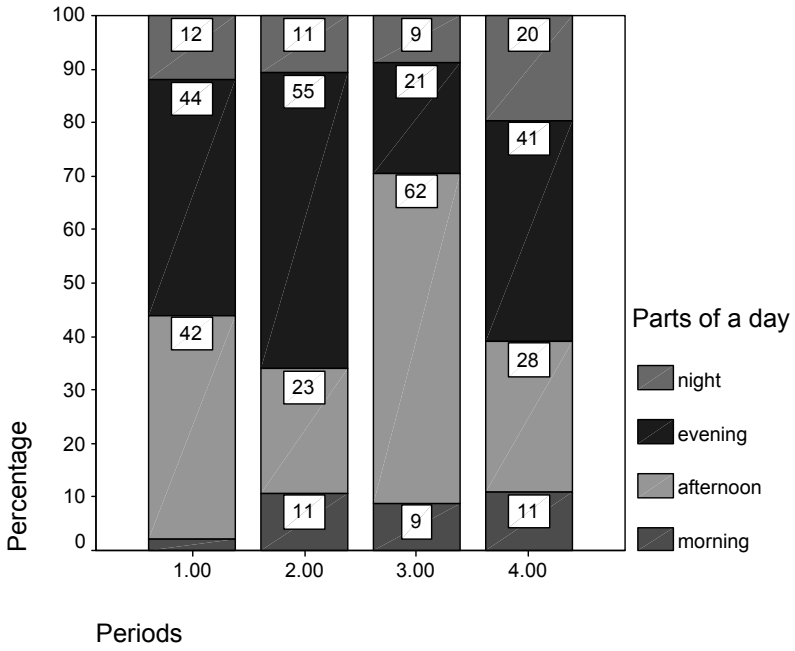


Figure 4.2 E-mail counts according to the parts of a day.

Table 4.12

Email counts according to the hours of a day.

Periods		Hours of a day				
		Morning	Afternoon	Evening	Night	Total
First	Count	1	21	22	6	50
	%	2.00%	42.00%	44.00%	12.00%	100.00%
Second	Count	6	13	31	6	56
	%	10.70%	23.20%	55.40%	10.70%	100.00%
Third	Count	3	21	7	3	34
	%	8.80%	61.80%	20.60%	8.80%	100.00%
Fourth	Count	5	13	19	9	46
	%	10.90%	28.30%	41.30%	19.60%	100.00%
Total	Count	15	68	79	24	186
	%	8.10%	36.60%	42.50%	12.90%	100.00%

4.3.4. Greetings and closures in e-mails

The messages were investigated to understand which greeting and closure messages the participants used during the four periods. This information is important since it gives an idea about whether or not the participants accepted themselves as a part of whole community.

The singular greeting used were hello, regards, have a good day, hello again while plural were hello to all (hepinize merhaba), hello friends (merhaba arkadaşlar), hello to everybody (herkese merhaba) and hello again to all (hepinize tekrardan merhaba). In all periods, the participants used generally plural greeting messages rather than singular messages. This showed that they addressed to all participants. Furthermore, the singular plural rate was investigated. Plural message ratio was 44% for the first period, 48% for the second period, 56% for the third period and 57% for the fourth period. The results showed that from first to fourth period the participants preferred to use more plural messages.

In closure part, the participants used more than one closure messages. For example, they sometimes used only goodbye (hoşçakal) while they added their names at the end of message in addition to it. All closure messages were good evening (iyi akşamlar), goodbye (hoşçakalın), goodnight (iyigeceler), have a good day filled in activities (aktivite dolu güzel günler), have a good health (sağlık dolu günler), have a good weekend (iyi haftasonları), have a good working (iyi çalışmalar), keep friendship (dostça kalın), respectfully

(saygılarımla) and see you later (görüşmek üzere). Among them, mostly used messages were goodbye, goodnight and see you later. Some participants added their names at the end of the comment. The researcher asked three participants why they wrote their names at the end of the e-mail. Two participants said that the main reason was introducing theirselves to the other who did not know which university they attended. The other also claimed that she always wrote their name with her university at the end of the e-mails. To her, this is her e-mail writing habit (Table 4.13).

Table 4.13

Greeting and closure e-mails.

	1st period		2nd period		3rd period		4th period	
Greeting	Count	%	Count	%	Count	%	Count	%
Singular	20	40	16	28	10	29	14	30
Plural	22	44	27	48	19	56	26	57
Nothing	8	16	13	23	5	14	6	13
Total	50		56		34		46	
Closure								
Nothing	3	11	5	12	12	34	11	37
Their names	18	64	19	46	13	37	10	34
Their names with their university	7	25	17	41	10	28	8	27
Total	28		41		35		29	

4.3.5. Emotions

During the discussions, some participants preferred to use some emotion images to make their feelings stronger. In total, there were 31 emotions in the messages, 11 for the first period, seven in the second period, five in the third period and eight in the fourth period. These emotions are  ,  ,  ,  and  .

Especially smiling faces,  ,  and  was preferred by the participants. The participants generally used smiling faces after the greeting. For example; "Hello dear friends  ". Another using place was in the closure part. After they explained their ideas, they used this emotion in the saying bye-bye part. Further, they also used it in the messages

after a positive idea was explained. For example, one of the participants used it while she was explaining how pretty her friends' proposal is.

> Bu arada ben S7 arkadaşımızın önerdiği etkinliği çok çok güzel buldum. 
>
> In addition, I credited the activity proposed by S7 as 'very very good'  (S4, from METU, P1)

The participants used sad face emotion when they felt hopelessness. One of the participants used it after he said everything we could make dependent on opportunities of the schools which we would be appointed after graduation. Angry face was used to explain negative ideas of the participants or their reaction to a contradictory idea.

4.3.6. Groups dynamics

By group dynamics I mean how the participants evaluated relationships among members out of discussion list discussions and during discussion list discussions. Therefore, the participants evaluated the learning environment under three main parts. The first part was "communication out of discussion list discussions". Second part was "within group dynamics" and the third part was "between group dynamics". In the second part, the participants evaluated effectiveness of the university they belong, while evaluating the other universities' effectiveness in the third part.

Communication out of discussion list discussions

Communication and sharing out of discussion list discussions was explored to understand whether or not there could be a warm relationship among participants. According to the results, most of the participants did not communicate with each other. Only seven participants communicated with each other. More specifically, one COMU student, two AU students and four METU students interacted with each other. Socialization net among the student can be seen in Figure 4.3. In the figure one correspondence shows weak communication while more than one correspondence shows strong communication between two participants.

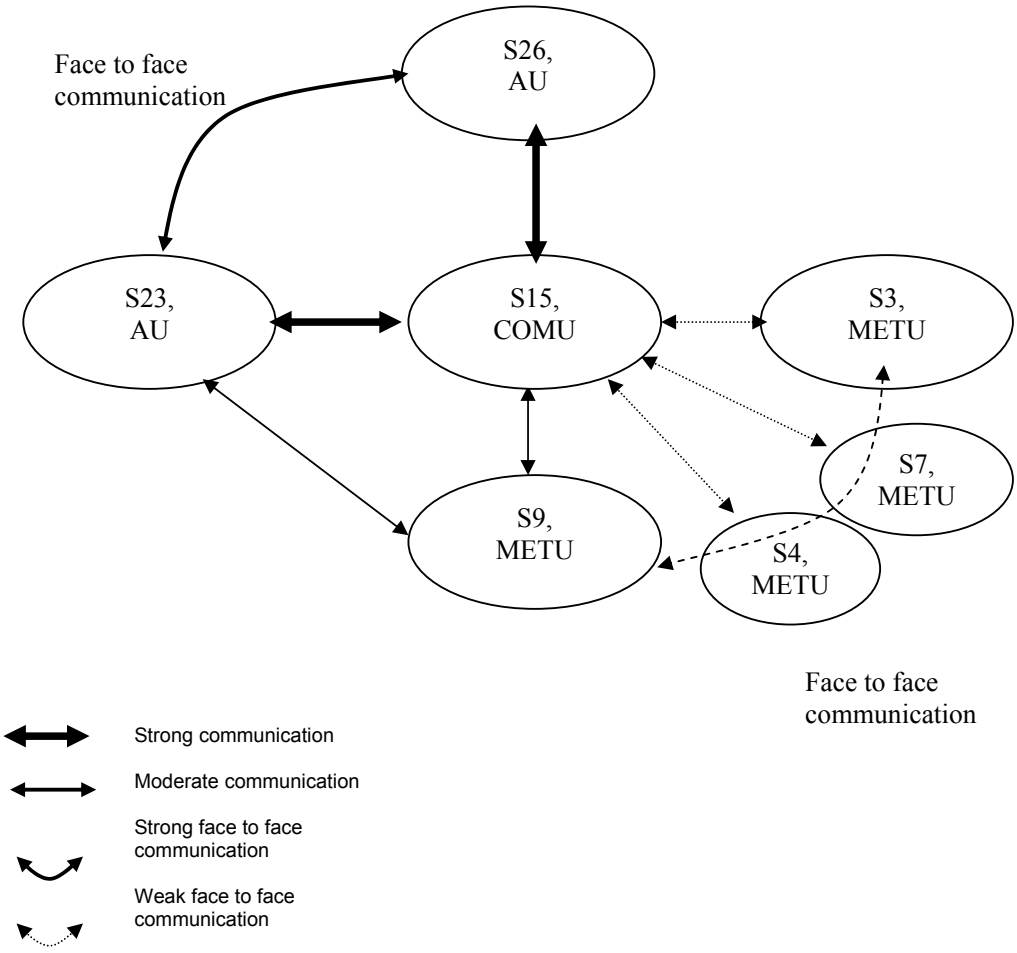


Figure 4.3 Socialization web among the participants.

In the PDC environment, socialization began with an e-mail coming from an AU student in the beginning of the term. As soon as she signed up the discussion list, she began to send e-mails about love and joke to the discussion list, again and again. Lots of these e-mails disturbed the other participants since they thought that their e-mail box would be full. Therefore, the researcher warned the participants about sending out of topic e-mails. The student explained what she thought when she was sending these e-mails.

> İlk başta bilmiyordum. Çünkü şey diye düşündüm sonuçta bu iletişim. İletişim, kaynaşmanız açısından vs. Bende eğer kabarık mailler olursa, espritüel mailler olursa başlarda göndermiştim. Sonra uyarılınca, bilmiyordum çünkü hocam. Çalışmamızın nasıl bir şey olduğunu bilmiyordum daha doğrusu. Başta öyle mailler göndermiştim konu dışında. Sonra zaten göndermedim.

> I didn't know at the beginning. I thought that this is a communication. Communication., in terms of becoming a unit. I thought that If there had been lots of e-mails, witty e-mails which I sent at the beginning…. Then, when I was warned [I didn't sent any mail]. I didn't know. Because, I didn't know what our study was. At the beginning I sent such e-mails. Then I didn't send. (S26, from AU, I).

Second socialization e-mail came from a COMU student. After the second period, between 31 October - 06 November, the student sent a celebration e-mail for the Ramadan Bayram to some students who she familiarized with them owing to their comments. Some of the participants liked this unexpected e-mail coming from an unknown people. A student explained her satisfaction to get this e-mail,

> Hocam, S15 ramazandan önce bayramımızı kutlamak için herbirimize ayrı ayrı postalar göndermişti. Bayram ile ilgili posta göndermek çok kibarcaydı. Kendimi ona daha yakın hissetmiştim. Aslında onu tanımıyordum. Bence eğer birbirimizi daha yakın tanıma fırsatımız olsaydı derste daha sıcak bir ortamda geçerdi.
>
> S15 sent an e-mail to some of us separately before Ramadan to celebrate the bayram☺. Sending e-mails related to the bayram was a very polite behavior. I feel more close to her though I have never met with her before. Therefore, I believed in that the environment would be warmer if we had the chance of knowing each other closer. (S6, from METU, R).

It can be seen from her words that this coming e-mail made her closer to the other students who she did not know before. So, she wanted to know more about her. This e-mail can be seen an introducing e-mail which began first spark to surge further warm communication. However, there were some students who did not like this e-mail. One of the participants explains their peers' opinion with these words,

> Aslında etkiliydi. Bana mesela çok pozitif bir şey gibi geldi ama çevremdeki arkadaşlarımı mesela olumsuz etkileyebildi. Hani sen niye herkese atıyorsun gibi. Bu olumlu bir şey beni pozitif yönde etkiler.
>
> Indeed it was effective. For example, I thought about that it was positive. But my friends affected negatively. Why did she send anyone? This is a positive thing which affects me positively (S9, from METU, I).

The other interactions among participants began by an e-mail including questions related to another participant's e-mail during discussion list discussions. Sometimes, they

preferred to send priviate messages apart from the discussion list. These e-mails were related to professional sharing. They asked questions to others and got answers. Every e-mail coming from such people caused them to reply it. So, a communication link between two participants established. The questions were related to ways they followed in other courses, such as Method or how they prepared lesson plan. They were generally pleased to have instant reply to their questions. One participant mentioned how she satisfied to reply a question coming from another student.

> Bazen sıcak anlar yaşandı ki bu güzel bir arkadaşlığa dönüştü, grup dışında da birbirimize yardımcı oluyoruz. Özellikle bizim ders planı gönderme haftamızda bana benim ders planımla ilgili mailler geldi. Onlara yardımcı olmaya çalıştım. Birilerine yardım etme duygusu beni çok mutlu etti. Bu mükkemmel bir duyguydu. Aslında ben geleceğin öğretmenlerine yardımcı olmuştum ☺.
>
> We lived warm times that transformed into good friendship. We sent e-mails to each other out of discussion list discussions. Especially, in the week when was our plan sending period, some messages came to me about my lesson plans. I tried to guide them. To be able to help some bodies made me happy. This was very magnificent sense. Rather, I helped the future teachers ☺ (S23, from AU, R).

It can be seen from the participant's word that as a student teacher she liked to help the others. She enjoyed being a guider.

The other participants who did not communicate with the other university students interacted with them only by group activities such as, posting e-mail to discussion list, reading their messages, etc. One participant explained why he did not send any personal message to the others.

> Benim onlarla iletişimim sadece maillerini okumakla sınırlı kaldı. Onlara hiç mesaj atmadım ve hiç kimse bana göndermedi. Ama bence bu birbirimizden faydalanmak için yeterliydi.
>
> My communication with them was limited to only reading their posting. I didn't send any e-mail to other university students and nobody send any mail back to me. However, in my opinion this communication was sufficient to get benefit from each other. (S8, from METU, R).

Another participant simply said why he did not communicate with the others,

> Bu aktiviteler dışında iletişim kurmak için fazladan vaktimiz yoktu.
>
> We did not have any extra time to communicate out of activities. (S1, from METU, R).

When the all communications which was mentioned above, are taken into consideration, some factors which impede sincerity among the participants was revealed. These are

- ❖ Existing strong communication link within their own university members,
- ❖ Some prejudices towards the other university students, and
- ❖ Disturbing messages.

First, if a participant had closed to out and does not need to the other people, she or he did not develop sincerity among them. That is, their own group members were sufficient to communicate. Second, some e-mails caused the participants to have some prejudice to other university students. They thought that if a participant from one university did not make meaningful comments on the discussion list, all participants from the same university are the same and it was not important to communicate with those people. Last factor was related to messages including disturbing content. This case occurred between S15 and S3. After the bayram celebration from S15, S3 send thank to S15. After that he wanted to her phone number chatting. This event disturbed the female student and she finished the communication.

The participants proposed some solutions to increase this type of communication.

- ❖ A free correspondence period among the participants, and
- ❖ Long face to face communication opportunity.

To them, in free correspondence period at the beginning of the term they could share activities or lesson plans they prepared before. In addition, long face to face communication would allow increasing this type of communication.

Within group behaviors

The participants determined “within group dynamics” in the frame of effectiveness of their own group and their own group members. That is, the participants from METU, AU and COMU evaluated participants from METU, AU and COMU, respectively. This issue is analyzed based on the participants’ reflection reports.

Effectiveness of their own group

The participants evaluated effectiveness of their own group. Totally, most of the participants claimed that their group was effective. That is, 19 out of 28 students appreciated their own group as effective. According to sub-groups, 10 out of 11 students from METU, six out of nine students from AU and three out of eight students from COMU evaluated their group as effective. In sum, METU and AU students accepted themselves effective while only COMU students evaluated their group as ineffective (Table 4.14).

After examining their simple answers to the effectiveness, their comments on their group's effectiveness were investigated in detail since they made more detailed explanation in addition to their simple answers (Table 4.14).

Table 4.14

Effectiveness of the groups.

	Universities			
	AU	**METU**	**COMU**	**TOTAL**
Effective	6	10	3	19
Not effective	3	1	5	9
Reasons for ineffectiveness				
Being busy	3	-	2	5
Technical reasons	5	-	4	9
Unwillingness	2	-	3	5
Lack of communication in the group	2	-	-	2
e- mail quality	-	6	-	6
Reasons for effectiveness				
Lesson plan	3	-	-	3
Comments	1	5	2	6

Reasons for effectiveness

The participants paid attention to their lesson plans and comments while they evaluated the effectiveness of their groups. Three students from AU students said that their lesson plans were better than the others' plans. There was no idea from other two groups related to lesson plans. Related to comments, five from METU, one from AU and two from COMU supported the idea of "our comments are well".

Reasons for ineffectiveness:

The participants evaluating their group as ineffective explained why they appreciated their group as ineffective. To them, some problems decreased their participation to the discussions. These were being busy, technical reasons, involuntary participation and lack of communication in their own group.

Being busy

Related to this, the participants said that their friends could not participate effectively since they had lots of homework and they were preparing for KPSS, supported by five opinions. That is, they had not enough time to participate to discussions since they were busy. One student said,

> Üniversite 4. sınıf olmamızdan dolayı, zamanımızı oldukça verimli kullanmamız gerekmektedir. Bir yandan okulda verilen ödevler ve yapacağımız sunular, diğer yandan da öğretmen olmamızın önündeki engel olan kpss sınavına çalışmamız gerekmektedir. Bu sebeple grubumuzun portalda etkili olamamasını normal karşılıyorum.
>
> Because of being fourth grade we have to spend our time more effectively. In addition to homework and presentations, we have to work for KPSS, an obstacle for being a teacher. Therefore, it is normal for my group not to be effective. (S20, from AU, R).

Technical issues

The most repeated reason was related to technical issues, supported by nine opinions. AU and COMU associated ineffectiveness of their groups to technical reasons. There was no idea on this issue coming from METU students. One participant said that;

> Video izlemekteki problemler yüzünden grubumun etkili olduğunu düşünmüyorum. Bir kaç kere sınıfa hoparlör getirdik. Teknolojiyle uğraşmak kolay değil çünkü biz bu konuda bilgili değiliz.
>
> I don't think that our group is effective because of problems of watching video. A few times we brought speaker our class. Technology was a hard job for us since we were not good on it. (S21, from AU, R).

Unwillingness

Another issue was unwillingness, which was supported by five participants. The participants supporting this idea were active members of their own group. Therefore, their opinions were important. They observed that some of them were unwilling to participate the discussions. Therefore, these participants did not contribute to the environment. One active member of the group said that

> Bu projeye grubumun çok iyi bir katkısı olduğu kanısında değilim, etkililiğimiz oldukça düşüktü. Bazı aksaklıklar vardı ve bazı grup elemanları projeyi yürütmekte çok da istekli değillerdi. Zaman zaman videoları açamamaktan kaynaklanan sorunlar oldu, zaman zaman da derslerin yoğunluğu, vizelerin olması v.b gibi mazeretler söz konusuydu. Bence daha etkili bir performans gösterilebilirdi ama olmadı. Ben en önemli etken olarak isteksizliği görüyorum.
>
> I don't think that my group made a good contribution. Our effectiveness was quite low. There were some problems and some of my group members were not willing to go through with the project. Some of the excuses are not having time, video related problems or exams, etc. Indeed, the most important factor was unwillingness. (S14, from COMU, R).

Lack of communication

One of the participants from AU emphasized lack of communication in the group. She said,

> Dışarıdan birinin grubu daha etkili yapmak için yapacağı bir şey olduğunu düşünmüyorum. Benim grubum için siz hiç bir şey yapamazsınız. Etkisiz çalışma bizim bir araya gelememizin bir sonucudur.
>
> I don't think that there was anything to make our group more effective from the outside. You can not make anything to improve if you talk about for my group. Inefficient working is the result of our disunity. (S25, from AU, R).

Some students from METU judged quality of the comments. Their group effectiveness decreased because of 3 e-mail necessity. Therefore, they said that they sent low quality messages especially in the third mail to the discussion list.

> Ancak yorumlar yapılırken belli bir yerden sonra, özellikle son üçüncü maillerde tıkanıklar ortaya çıktı. Artık yeni şeyler yazılamaz oldu ve her yazılan yorum bir öncekilerin tekrarı ya da bir özeti niteliğine dönüştü. En azından benim için böyle oldu bu durum. Bu da sanırım gruptaki çalışmanın verimini düşürdü.

> Especially in third e-mails a bottleneck occurred. Anymore, we couldn't find anything to write and new writing has become the repeat of the others or a summary of the other. At least this was so for me. I think this decreased quality of studies in the group. (S2, from METU).

Effectiveness of their own group members

In their reflection reports, the participants evaluated themselves by means of their comments and lessons plans. Most of the participants reported positive ideas about themselves. Nine students from METU gave positive ideas about themselves, while two were moderate. There was not any member from METU which negatively criticized her/himself. Three students from AU gave positive ideas about themselves, while two as moderate members and four students gave negative ideas related to them. Lastly, four students from COMU gave positive ideas about themselves, while two as moderate members and four students gave negative ideas related to them (Table 4.15).

Table 4.15

Evaluation of their own group members

	Universities			
	AU	**METU**	**COMU**	**TOTAL**
Positive ideas	3	9	4	16
Negative ideas	4	-	2	6
Moderate	2	2	2	6
Total	9	11	8	28

The participants' selected explanations on those issues are as follows;

Positive ideas

Nine from METU, three from AU and four from COMU stated positive ideas related to their group members' messages. These students described their ideas as appropriate, related, diverse, new topics which nobody touches on, comfortably expressed and valuable comments. In addition, some of them said that they were active, successful, participant, eager, enthusiastic, not being a stranger and responsible members. One of the participants explained his success explicitly,

> Beni yanlış anlamanızı istemiyorum ama bence ben grupta oldukça başarılı bir elemandım. Videoları dikkatlice izleyerek aktivitenin uygulamasındaki

> problemleri bulmaya çalıştım. Videoların güzel ve yaratıcı noktalarını atlamadım. Bulduğum bu konuları tartışmalara aktardım. Özellikle tartışılabilir şeyler yazdım ki herkes farketsin de şöyle güzelce tartışalım diye. ☺
>
> I don't want you to misunderstand me but I believe that I was a successful member in the group. I tried to find problems in application of activities by means of watching videos, carefully. So, I didn't omit good and creative points of videos. Then, these points, I captured, were transmitted to discussions. I especially focused on discussable topics so that the others could notice my messages. So, we can discuss in-depth ☺ (S2, from METU, R).

Another member presented positive ideas related to himself and added why he waited for the last minutes of discussions.

> Kendimi grupta aktif bir eleman olarak gözlemledim diyebilirim tartışmalarda genelde yapıcı olmaya çalıştım ama genelde yorumları son günlere doğru yazıyordum sebebi ise diğer arkadaşlarımın neler yazdığını okumak istememdi. Bu sekilde yorumlarımı güçlendiriyordum.
>
> I observed myself an active member of the group. I tried to be positive in the discussions. However, I generally wrote my e-mails in the last days of discussion period since I want to read what the others had written. (S3, from METU, R).

Negative ideas

Four from AU and two from COMU presented negative ideas about themselves. The participants evaluated themselves as less participative. In addition, some of them explained reasons of not being participant. These reasons were related to their time problem and computer skills.

> Ödevler ve KPPS yüzünden başarılı bir eleman olamadığıma inanıyorum. Hatta bilgisayarlarla çok haşır neşir olmamamda bunun bir sebebi.
>
> I believed that I was not a productive member because of homework and KPSS. Further, that I am not familiarizing with computers is another reason. (S21, from AU, R).

Moderate members

Two students from AU, three from METU and two from COMU accepted themselves as moderate members of their own groups. One student explained why he evaluated himself as moderate member.

> Bende kendimi orta halli bir eleman olarak görüyorum çünkü grupta benden daha aktif ve daha az aktif kişiler vardı. Mümkün olduğunca aktivitelerin iyi ve yanlış yerlerini aktarmaya çalıştım. Her nekadar arkadaşlarım beni eleştirsede objektif olmaya çalıştım.
>
> I see my self as a moderate member since there were more active and less active members than I was in the group. As far as possible, I presented both good and negative points of the activities. I tried to be objective although sometimes my friends criticized me. (S8, from METU, R).

Between group dynamics

Between groups dynamics were evaluated in the frame of evaluation of the others' comments and behaviors of the participants to each others.

Evaluation of the others' comments

In their reflection reports, the participants evaluated contributions of other university students. 17 out of 28 students stated positive ideas about other groups. Five out of nine from AU stated positive ideas related to the others' e-mails, while the other two participants had negative ideas. Eight out of eleven from METU stated positive ideas, while three participants had negative ideas. Six out of eight from COMU stated positive ideas while there were not completely negative ideas (Table 4.16).

The participants drew attention to their department differences. Four opinions on department differences included positive ideas while three ideas included negative criticism to the others' e-mails. One of the participants from METU explained how he benefited from the others' plans.

> Sınıf öğretmenliğinden katılan arkadaşların matematik konuları hakkındaki görüşlerini öğrenmek şahsen benim için güzel bir deneyim oldu. Bu süreçte yaptıkları ders planlarını da bizimle paylaştılar. Yalnız yaptıkları ders planlarının biz matematik öğretmelerinin yaptıklarından epeyce farklı olduğunu gördüm. Biz konuyu ders planlarımızda daha detaylı incelerken; onlar planlarında konularını genel hatlarıyla ele almışlar. Böylece

> ilköğretim I. kademede yapılan ders planları hakkında biraz daha bilgi sahibi oldum.
>
> Personally, I got an enjoyable experience by means of learning the others' opinions [from primary education] on mathematics education. In the process, they shared their lesson plans. I noticed that their plans were different from us. While, we examined the topic in-depth, they got topic in general framework by emphasizing assessment part. So, I could get more knowledge about how to make lesson plans for the first step of elementary education. (S8, from METU, R).

A contrary opinion came from another METU student. The student evaluated their lesson plans as weak.

> Bizler farklı bölümlerdeyiz. Onlar sınıf öğretmenliğindeler. Ne yazıkki onlar matematik eğitimi ile ilgili bilgi üretemediler. Bunu onları eleştirmek için söylemiyorum. Eğer biz sınıf öğretmenliğinde olsaydık biz de öyle yapacaktık. Farklı branşlardan videolar onlar için daha faydalı olabilir.
>
> We are in different departments. Because their department is primary education. Unfortunately, they could not produce in-dept knowledge related to mathematics education. I didn't say this to criticize them. If I were attending in primary education, I would do this. Videos belonging diverse fields may be more beneficial for them. (S3, from METU, R).

Indeed, there were opposite opinions on lesson plans. Participants criticized others university participants' lesson plans. Every student accepted their universities' plans more beneficial while she/he makes negative comments on the others' plans. For example, a student from AU evaluated his lesson plan more qualified than the others. He explained his ideas as

> İncelediğim planlar arasında en etkili ve düzeye uygun planlar bana göre Türkiye'nin en iyi eğitim kadrosunu içeren Ankara Üniversitesi Eğitim Bilimleri Fakültesi öğrencileri tarafından yapılmıştır. Yapılan diğer planlarda öğretmen mesleğinin getirdiği özveriyi ve ruhu bulamadım.
>
> Among the lesson plans I examined, the most effective and the most appropriate plans for level of students were the ones coming from AU students, faculty of educational sciences which has the most successful staff. I couldn't see any sacrifice in other lesson plans. (S20, from AU, R).

It can be seen from the comments that there was a dispute between groups on the quality of lesson plans coming from different universities.

Some students criticized that some messages coming from others included similar content to e-mails coming before. Further, there were some members who sent e-mail only to achieve their responsibility. One student explained

> Bizim için faydalı ve aktivitelerdeki önemli yerlere değinen fikirler geldi. Ancak bunların sayısı azdı. Ve sadece görevini yerine yetiren öğrenciler vardı.
>
> There were some opinions that were beneficial for us and capturing good points of the activities. However, the number of them was low, there were some students who aiming only to fulfill their responsibilities. (S3, from METU, R).

Two opinions were related to e-mails including English words. One of the participants criticizes the e-mail from METU since it included English words. She stated that

> Yaptıkları yorumlar plan hazırlayacak öğrencilere ışık tutuyordu. Bazı arkadaşlar yorum maillerinde bazı İngilizce sözcüklere yer veriyordu. Bazı kuram veya yaklaşımların İngilizcesini yazıp Türkçe açıklamasını yapmıyorlardı. Bu projeye katılan bütün öğrencilerin (başta ben) yazılan İngilizce sözcüklerin anlamını bildiğini düşünmüyorum. Kendi üniversitelerinde İngilizce eğitim almış olabilirler ama diğer gruplardaki arkadaşların İngilizce eğitim almadıklarını düşünmediler mi?
>
> …Their comments light the way of plan writers. They included troubles and good points of the videos. However, some friend's comments included English words. They didn't add Turkish mean of theories and approach in addition to their english. All students in the project can not know their meaning (first of all, me). They can get English education. However, didn't they think that we don't know English? (S12 from COMU, R).

One participant's following mail permanently began to know personality of the members. She explained her ideas as

> Bazı arkadaşlar güzel eleştiriler yaptılar hatta onların görüşleri oldukça orjinaldi. Sadece bu arkadaşların maillerini okuyarak bile dönem ortasında onların kişiliklerini tahmin edebilir duruma geldim. Bu oldukça eğlenceli bir durumdu.
>
> ..Some friends made good criticize and their view point is also original. By reading comments from these friends, I can estimate his /her personality through the middle of the term. This is very enjoyable situation. (S15, from COMU, R).

Table 4.16

Evaluation of the others' comments during discussions.

General attitude	Universities			
	AU	**METU**	**COMU**	**Total**
Positive	5	8	6	19
Negative	2	3	-	5
No comment	2	1	2	5
Different frames owing to department diversity	2	7	-	9
Full responsibility	2	1	-	3
Disconnected comments	-	1	-	1
Language differences	1	-	1	2
Messages including similar content	2	3	1	6

4.4. Critical factors effecting the quantity and complexity of interactions among the participants

4.4.1. Driving reasons which increased participation to the PDC

During discussions, following driving reasons forced the participants to contribute to the discussions in the environment. These reasons will be explained more detailed in the following parts.

- Supporting own university students' ideas,
- Gaining reputation,
- Questions and answers,
- Self confidence and having wide ranging knowledge,
- Readiness level for life long learning,
- Having diverse ideas,
- Citations from original comments,
- Transmission of prior knowledge,
- Quality of cases,
- Advantage of the Internet environments.

Supporting own university students' ideas

During interviewing three participants from AU and COMU stated that METU students tended to support their own group member opinions. The similar ideas came from reflection reports. Therefore, METU students were requested to conclude this result. They also approved this result. That is, METU students supported their own university students' opinions. That is, there was a polarization among the participations according to their universities. One participant mentioned her feelings with these words,

> Yanlış anlaşıldığımı düşündüm hep. Bir yorum yazıyorsunuz. Arkadan aaahh hepsi… Kötü bir amaçla yazmıyorsunuz, sırf katkı olsun diye yazıyorsunuz. Hepsi birbirini savunucu şeyler yazmıştı. Biraz yalnızlık hissettim.
>
> I always thought that they understood wrong me. You write comments. Then, ahh…all of them. You didn't write with a negative purpose, only for contribution. All wrote supporter things together. I felt lonely (S15, from COMU, I).

Gaining reputation

During the discussions, six participants needed to thank owners of the messages since they credited sending activity as interesting or successful. In addition, some members replied e-mails when they read them. All of these behaviors are because of feeling of gaining reputation. For example, one of the participants sent following e-mail although the discussion term was closed.

> Ben ODTÜ grubundan X. Ders planlarını inceledim. Hepsi çok başarılı olmuş. Arkadaşlar eksiklikleri giderebilmişler diye düşünüyorum. Özellikle S23 arkadaşımızın gönderdiği plan çok etkili olmuş. Değerlendirme bölümü çok açık verilmiş. Yani bu planı eline alan herhangi bir öğretmen bu dersi çok rahat işleyebilir ve değerlendirmesini de çok rahat yapabilir. Kurt-kuzu oyunu ile sınırlı kalmadan daha pek çok etkinliğin bu konu için bulunabileceğini gördük. Çok teşekkürler S23.
>
> This is X from METU. I investigated lesson plans. All are very successful. I thought that the friends complete the lacks of video activities. Especially, the lesson plan, which was S23 sent, has been very effective. Evaluation part is very clear. That is, any teachers who will read the plan teach this lesson very easily and make its evaluation easily. We see that lots of activity can be performed without limited in wolf-sheep game. Thank you very much S23!. (S9, from METU, P1).

During interviewing, one participant mentioned her experience with another participant,

> …Ben mesela X 'e ayriyetten teşekkür mesajı atmıştım. Mesela onun maili hoşuma gitmişti. Burada ne demek istemiştin diye mailleşmiştik biz. O bana "gayet güzel bir çalışma tebrik ederim" diye cevap yollamıştı hatta.
>
> For example, I sent to X an additional thank message. For instance, I liked her mail. I sent her an e-mail about what she tells here. Moreover, she replied "quite lovely work, congratulations". (S26, from AU, I).

Three participants said in their interviews that one of the reasons which forced them to write was to reply to others' mails. These participants told the same things. One of them said,

> Bunun sebebi, çok basit. Başkasına yanıt. Çünkü ben hocam hepsini okudum. Noktasına, virgülüne…bana birisi yazdığı zaman da ona cevap yazma gereği hissettim.
>
> The reason of this is very simple: reply to others. Because, I read all of them in detail. When one wrote to me, I needed to reply his/her e-mail. (S14, from COMU, I).

Questions and answers

Group members asked some questions to other participants to know their opinions on specific topics. During the discussions, all questions were answered by the participants. The type of questions also affected the number of answers.

For example, one of the participants asked a question to the participants who would be first step elementary school teacher since she did not know the answer. Totally five e-mails were sent on this topic. The participant said in her interview why she asked questions to other participants with these words,

> Çünkü devam eden soru sorma cevabını alıp yollama durumları da oldu, zaman zaman. Sınıf öğretmenlerine sorma durumum oldu "şunu nasıl yapardınız? bunu nasıl yapardınız?" Öyle durumlarda soru sordum.
>
> Because a question - answer series sometimes happened. I asked the participants from primary school "how do you do this, how do you that?" in these situations, I asked questions to them. (S9, from AU, I).

In period two, this participant asked the question which she mentioned above,

Özellikle resim dersinde faydalı olabilir. Sonuç olarak tangram parçalarını resim dersinde farklı renkte kartonlar kullanılarak yaptırılabilir. S7 arkadaşımızın ilk yorumunda ki şekil çok uygun. Tabi bu konuda ne kadar haklıyım bilemiyorum. Sınıf öğretmenliği bölümündeki arkadaşlarımız resim dersinin kazanımları hakkında daha çok bilgiye sahipler. Böyle bir ilişkilendirme doğru olur mu diye soruyorum.

It [tangram] especially can be useful in drawing course. As a result, tangram figures can be created by using colorful cardboards in drawing course. The form in the first comment of S7 is appropriate for this. Of course, I don't know how much I am true. first step elementary school teacher candidates has more knowledge about gains of drawing course. I am asking whether or not this connection is true. (S9, from METU, P2).

Three participants answered this question. One of the answers to this question was,

S9 arkadaşımızın tangram konusunu resim dersiyle ilişkilendirmesi çok güzel, bu yeni programda ki displinler arası ilişkilendirmeye de örnek olur. Ancak unutmamalıyız ki resim dersi bir ifade dersidir ve yaratıcılık ön plandadır, akılcı gerçeklikle görsel gerçeklik bu derste içiçedir, matematikte ise akılcı gerçekçiliğe ulaşmak gerekir. Matematikte geometrik şekiller işlenirken resimde iki ve üç boyutlu tasarım çalışmaları ve kağıt süsleme çalışmaları yapılmaktadır.

It was good that S9 connected tangram topic with drawing course. This is an example for inter disciplines relation in new curriculum. However, we don't forget that drawing is a expression course and creativeness is foreground. Rationalist reality and visual reality is in this course. In mathematics, reaching rationalist reality is a necesssity. In mathematics, geometric figures are thought; in drawing, making 2 or 3 dimensional design and paper decoration can be made. (S23, from AU, P2).

In contrast to this question which kindly answered, in period three, one of AU students asked following question to all participants,

X öğretmen şekilleri tahtaya çizerken yanlışlık yaptı ve bu yanlışlıkları da eliyle sildi, tahta silgisini kullanması gerekiyordu! Bu durum öğrencilerin yanlış öğrenmelerine sebep olmuştur ve öğrenciler ilerleyen günlerde aynı davranışı yapabilirler. Bu konu hakkındaki görüşlerinizi bekliyorum.

Teacher X made a mistake while drawing the figure on the board and she cleaned this mistake with her hand. She should have used an eraser. This fault caused children learnt wrong and in the following days, they would make the similar behavior. I am waiting for your opinions about this topic. (S28, from AU, P3).

Only one participant answered to this question,

Tahtayı elle silme olayına değinen arkadaşım için "her şey tam da bir o mu kaldı eksik, yanlış :)))"

To the participant who touches on cleaning blackboard with hand “everything is complete; is this incomplete, wrong? :)))” (Zeynep, from METU, P3).

In their reflection report, two participants also criticized that this question was nonsense. Details bothered the participants. They criticized her and thus they did not answer this question. One of them said,

…Bazı arkadaşlar etkinliklerin gereksiz noktalarına değindiler diye düşünüyorum (hoca eliyle tahtayı silmesi sakıncalı). Ne cevap yazabilirsiniz ki?

…I thought that some of the participants touch on unnecessary point of activity (The teacher clean the blackboard with her hand). What would you write to this question? (S3, from METU, R).

Self confidence and having wide ranging knowledge

Self confidence was another factor which affected contribution. Five participants stated in their reflection reports that if a pre-service teacher had believed him/her self he/she would have not avoided putting his/her opinion in front of the other people. One interviewee also supported this idea.

Birazda öğretmenliğin yetişmişliği, yetkinliği açısından söyleyeyim; daha yetkin olan, daha çok kendine güvenen daha çok kendini böyle rahat ifade ediyor. Ben bu konuları biliyorsam bir şey söyleyebilirim. (S11, METU, R).

Let me tell in the the frame of being sophisticated in teaching. The more you are effective and sophisticated, the more you tell yourself more comfortably. If I know these topics, I can say. (S11, METU, R).

Bilenler. Ben biliyorum ki bunu yapıyorum. Kaçanlar, pasif olanlar biraz da bilmediklerinden. Hani ben bu yorumu yapıyorum, o da “a evet bu doğru” deyip kenara çekiliyor ya da çekilmiyor. Onu bile söyleme nezaketinde bulunmuyor belki. Bu konu hakkında hiçbir düşüncesi yok. O yüzden.

Conversants… I know and I make this. They are passive because they don’t know. I made this comments. As soon as she/he said “yes it is true”, she/he finishes her responsibility. May be, she are not so kind that she will tell this (this agreement). She does not any idea about this topic. (S23, from AU, I).

Readiness level for life long learning

During the interviewing two participants emphasized the importance of life long learning idea. They accepted themselves as life long learners. They want to develop themselves not only for getting a good grade but also for their next professional life. They believed that they, therefore, were more active in the discussions than some of their friends. In addition, these participants believed that some of their friends accepted pre-service courses as a barrier to graduate and they studied only to pass from these courses. They also carried this idea to this online environment. That is, their friends behaved unwillingness not only in this environment but also in other courses. They only made their responsibility.

One of them said,

> Bir konu hakkında tartışmak, görüşmek hoşuma gidiyor yani. Öğrenmek. Mesela hocam ben 4. sınıftan sonrada yüksek lisans yapmak eğitimimi daha da ilerletmek istiyorum. İnşallah nasip olursa daha da ilerlemek istiyorum. Çünkü insanoğlu bilgiye aç. Değişmek zorunda. Ama belki arkadaşlar Kpss, şuydu, buydu istemediler. "Biz görevimizi yaptık" dediler. Zaten en fazla 3 mesaj durumumuz var. ben öyle düşünmüyorum hocam. Ben şu anda da mailleri takip ediyorum. Bir konu eğer beni çok ilgilendirirse ya da görüş olarak zıt gelirse ben onun hakkında yorum. Neden istediniz burada, altında yatan sebepler neydi sorarım. Çünkü öğrenmek istiyorum.
>
> I liked to discuss and to talk about something. That is, learning. For instance, I want to do Master program in science after graduation and improve my professional development. Hopefully, if it is possible I want to develop more, because, human beings need knowledge. They have to change. But, the friends [in the project] didn't want this because of KPSS or others, etc. they said "we completed our responsibilities". We already had to send 3 mails at the most. I don't agree with them. I am still following my e-mails. If a topic is very interesting for me or it is too controversial to me I [write] a comment to it. I asked reasons to explain them and what they wanted, because, I want to know. (S26, from AU, I).

Having diverse idea

In 12 e-mails, the participants stated that they had different comments from the others. That is, having a diverse idea related to video activity forced the participants to write to the discussion list.

An example from the discussion list discussion were,

> Şimdi ise diğer arkadaşlarımın yorumlarında görmediğim bir konuya değinmek istiyorum. Yeni müfredatta matematiğin diğer derslerle ilişkilendirilmesi konusu üzerinde duruluyor. Bence tangram konusu buna çok uygun. Özellikle resim dersinde de kullanımı güzel ve faydalı olabilir

Now, I want to touch on a topic which I didn't see in the others' comments. In the new curriculum, it is emphasized mathematics' connection with other courses. In my opinion, tangram is very appropriate for this. (S9, from METU, P2).

One interviewee also said,

Bilmiyorum hocam. Belki görüşümün farklı olması. Benzer fikirlerin geldiği çok oldu. Ben farklı bir şey aklıma gelir gelmez mail göndermeyi tercih ettim. Seyrettikten sonra biraz kendime düşünmek için vakit ayırıyordum .

I don't know Mrs. Baran. May be I had a different opinion. Similar ideas often came. As soon as I catch a different idea I preferred to send e-mail. After watching the videos, I had a time to think about them. (S14, COMU, I).

Transmission of prior knowledge

Most of the participants said that they transmitted their prior knowledge to the environment. Therefore, they could make richer comments. This factor affecting the quality of the discussions was also discussed in the beginning of this chapter (see heading 4.2.2.) with the examples that could reveal the contribution of the PDC on the participants' professional development. Two participants said,

Ben de elimden geldiğince gruba en iyi katkıyı yapmaya çalıştım. Bütün videoları dikkatlice seyredip analiz ederek, bugüne kadar öğrendiğim eğitim bilgilerini ve kendi eğitim ideolojimi de ekleyerek düşüncelerimi dile getirdim.

I tried to do best contribution to the group as I could. I expressed my opinions by adding my own educational ideology and by analyzing knowledge which I learned before after I watched the videos carefully. (S11, from METU, R).

Diğer grup arkadaşlarımla genelde yazdıkları yorumlara ek yorumlarda bulundum, ya da katılmadığım noktaları belirttim. Ayrıca bu sene Mine hocamızdan aldığımız metod dersinde öğrendiklerimizden de bahsetmeye çalıştım. Sınıf sunumlarında verilen örneklerden ya da etkinliklerden örnekler verdim.

I contributed to other friends' comments or added some ideas which I disagreed with. In addition, I tried to talk about the things which learned in the method course which I took in this year. I referred to some examples or activities given in classroom presentations. (S6, from METU, R).

An interviewee also stated how she transmitted the things which she learned in a face to face course to the PDC,

> Orada da mesela Sinan Hoca demişti "bakın çocuklar puntolar, seçeceğiniz karakterler" mesela ben 1. sınıfa boy kavramını veriyorum hocam. Daltonların resimlerini koydum. Çünkü çocukların ilgisini çekiyor. Çocuklar seviyorlar. Red Kit ve Daltonları takip ediyorlar. Dalton soruyu soruyor. Altta Red Kit. Red Kit silahlarını kaldırdım mı? Yani bunlara bile dikkat ettik. Silah olmaması lazım. Sizin sunularınızda [tartışmalarınızda] da bunlara dikkat ettik. Videolarda olsun tartışmalarda olsun.
>
> For example, Mr. Olkun told us "children, pay attention punto, character type…" For example, I teach the height concept to the first grade level students. I used the Dalton's pictures because, the picture attract children' attention. Children like Lucky Luke and Dalton and follow them. Did I remove Lucky Luke's guns [in the pictures] ? We paid attention to even this. Guns must not be [in the pictures]. In your discussions we paid attention to these points in videos or discussions. (S26, from AU, I).

Citations from original comments

During the discussions, the participants generally cited other participants' ideas. Reason of citation was agreement or disagreement. In addition, the participants cited from other comments when they could not find anything to write. That is, in their e-mails, the participants generally criticized or supported an idea. However, citation of a comment did not force owner of the comment to reply this mail. Most of the mutual discussion generally finished after this point. The participants used a general addressing, a subject or an opinion to cite.

A student who used a general term "friends" to cite said,

> Arkadasları paralelkenar ile ilgili açıklamalarına katılarak şunu belirtmek isterim ki, yeni şekli farkeden öğrencinin onu tanımlamasında öğretmen yetersizliği göze çarpmakta, öğretmen bunu zamanı değil diye yapmadı belki ama en azından paralelkenarın adını kullanmadan hangi şekillerden oluştuğunu sorabilirdi öğrenciye
>
> I agree with my friends' explanations related to parallelogram and I stated that there was a teacher failure in a student' describing new figure when she/he noticed it. May be the teacher didn't teach them because it was not a good time but at least she would ask which geometric figures it could be made up without using its name. (S23, from AU, P2).

Another participant who used a subject "S7" said,

Ben öncelikle S7 arkadaşımızın ilk mailindeki değerlendirme ile ilgili yorumuna katıldığımı belirtmek istiyorum. Öğretmenin tangramı oluşturan 7 parçanın birbirine oranlı olduğunu belirtmesi gerekir.

At first, I stated that I agree with evaluation in S7's first mail. The teacher should have stated that 7 geometric figures have a ratio. (S4, from METU, P2).

Another participant who cited an opinion said,

Ben X 'in videosunda dersin dikkatsizce hazırlanmış olduğu fikrine katılmıyorum. Zaten ders planına baktığımızda da bunu görebiliyoruz. Ama uygulama kısmında bir takım zorluklar yaşanmış. Bu da çok sert eleştiri gerektiren bir durum değil bence

I don't agree with the idea which Teacher X' lesson was prepared carelessly. We understand this when we look at the lesson plan. However, there were some difficulties in implementation. In my opinion, these difficulties didn't require strict criticizes. (S7, from METU, P2).

Quality of cases

There were some specific teaching problems which were made by teachers in the videos similar to daily life examples. After one participant noticed these problems other participants sent a series of comment on this topic and thus the number of the messages coming from the participants increased. Two participants in their interview stated that they wanted to contribute to the discussions because of natural teaching problems in the activities although they completed their mail sending responsibilities. In addition to interviews, discussion logs also supported this reason.

For example, in the second period, the video teacher aimed to teach geometric figures to her students. In the video, after she distributed tangram pieces to each of five groups she asked names of each piece by showing geometric figures. The participants knew all figures except for parallelogram. Therefore, the teacher needed to define parallelogram. However, her definition was wrong. During the discussion list discussions, six participants recognized this problem. The wrong definition of the video teacher took attention of them and they talked about this case for a long time.

During the discussions one of the participants described the problem,

Şimdi etkinlik sırasında paralelkenar (çocuklar daha önce karşılaşmamış) faciası var ona değinmek istiyorum. Aktivite yaparken uygulayabileceğimiz birkaç method öğrenmiştik discovery vesaire. Bu durumda paralelkenar terimi kulağa ne kadar da ters geliyor yeni duyan bir insan için (en azından bana öyle gelmişti) ama daha sonra ortaokul yıllarında düşündüğümde

karşılıklı kenarların paralel olduğu bu yüzden buna paralelkenar dendiğini öğrenmiştim. Bizim öğretmenimiz de dikdörtgenden yola cıkarak paralelkenar' ı tanımlıyor (böyle dikdortgenin biraz kaydırılmış hali). Ee tabi elleri boş durur mu onlar da çalısıyor kaydırıyor yani. Kendimi gülmekten alamadım bu durumda aktivite sonrasında çocukların paralelkenarın tam olarak ne olduğu sorusuna cevap verebileceklerini sanmıyorum.

Now, during the activity, there was a parallelogram tragedy which I want to deal with (The children had never seen it). We learnt a few methods to perform an activity such as discovery, etc. The term "parallelogram" is nonsense for a person who heard first it (at least for me). But later, when I was in the middle school I had learnt that it was named after as parallelogram because opposite sides were parallel. However, the video teacher defined parallelogram owing to rectangular (a kind of rectangular which slides). Of course, her hands also depicts move. That is, she slides rectangular. I could not stop to laugh. As a result, after the activity, I don't think that the students would answer the question of what a parallelogram is. (S3, from METU, P2).

During the interviews, one of the participants mentioned her experience with this wrong parallelogram definition,

Öğretmenin ses tonu, sınıfa hakimiyeti çok önemli ve biz bunları da eleştirdik. Sadece matematik değildi. Bir öğretmenin, iyi bir öğretmenin, ya da iyi bir matematik öğretmeninin nasıl olması gerektiğini… ….öğretmenin mesela yanlış vurguladığı yerler vardı. O paralel kenarda bayağı bir uzun sürdü onun tartışması. Çünkü daha önce söylediğim problem vardı.

Voice level of the teacher, control ability of his/her class are very important and we criticized these topics not only mathematics. How a teacher or a good teacher or a good mathematics teacher would be. …For example, there were some points which the teacher emphasized wrong. Discussion of the parallelogram took a long time since there was a problem as I said before. (S26, from AU, I).

Advantage of Internet environments: flexible interaction

Four participants in their interviews said that people expressed their opinion in the Internet environment more comfortably. One said,

Karşımızdaki sonuçta insan. Duyguları var. Ama internet ortamında öyle değil. Ne bileyim, kendi beyninizde tasarlıyorsunuz ve onu karşınızdaki insana çok daha rahat söyleyebiliyorsunuz. Mesela, biz ne yaptık? Ders planları hazırladık. Onlara eleştirileri yaptık. Ama eminim ben, o arkadaşımla yüz yüze olsaydım; kalbi kırılır, üzülür, çok kötü eleştiririm demiyorum ama gerçekten bir insan için "bu şöyle olsaydı daha iyi olmaz mı?" demek, onun yerine ben kendimi koyarsam üzülürdüm hocam. Biz zaten ne dedik? Eleştirilsin. Daha iyiyi elde etmeye çalışalım dedik. Ama sonuçta orada bir emek var. Emeğin de "Şurası kötü olmuş. Burası böyle

olabilir" demek yüz yüze ben cesaret edemezdim açıkçası ama Internet ortamında böyle bir şey yok.

The others are also human. They have emotions. However, [communications in] the Internet environments is not so. I don't know, you design in your mind and you can tell it more comfortable [in the Internet]. For example, what did we make? We made lesson plans. We criticized them. But I am sure that if we had been face to face with my friends, I would have broke her/his heart or she felt bad. I don't say that I will criticize very much. But, the question 'would it be better if this should have been such?' causes to feel bad for a person. If I put myself him/her self I would feel bad. Already, what did we tell? Let us criticize. We said to try to obtain better. As a result, there is an effort to make it. For an effort, telling "this part is bad. Or this can be such", I can not dare to tell in face to face environments. However, Internet environments does not such. (S26, from AU, I).

In reflection reports, a supporting view came from another student who observed the other participants. She said,

Ayrıca arkadaşların düşüncelerini bu tür ortamlarda daha rahat ifade ettiklerini gözlemledim. Düşüncelerini özgürce ifade eden bireyler kendilerine güveniyor demektir ve bu da onların kendilerini geliştirmelerini sağlar.

In addition, I observed that my friends stated their opinions more comfortable in such environments. Individuals who stated their thought independently have self confidence and this provides to develop themselves. (S14, from AU, R).

4.4.2. The factors which decreased amount of contribution to discussions and affected quality of messages

In this environment, following reasons hindered the participants to contribute to the discussions and decreased the quality of messages. These reasons will be discussed in following headings in more detail.

- Departmental diversity,
- Not wanting to enter a fight,
- Lack of time,
- Unwillingness and involuntary participation,
- Unread prior comments,
- Low priority in their life,
- Familiarization with the Internet,
- Internet access,
- The length of discussion periods,

- Three mails rule,
- Watching video, and
- Discussion list use.

Departmental diversity

Four participants stated that the same university students sent similar comments and studies to the discussion list.

> Onların yaptığı hacim çalışması vardı. Küpler ile ilgili. Gerçi hemen hemen hepsi aynı şeyi yapmıştı. Ben ilk baktığımda hoşuma gitmişti. Z ile başlayan bir kız vardı. S6 gönderdi herhalde tam hatırlamıyorum. Onun bir çalışması vardı. Sonra hepsi aynı çalışmalar geldi hocam. Ben bunun eleştirisini yapmıştım. Neden hep aynı? Hepsi küp şeker getirmişti sınıfa. Belki de kitaplarında vardı o örnek bilmiyorum hocam. Biz genelde matematik hocası bize küpler getirmişti sınıfa. Küp şeker daha akılda kalıcı bir şey. Farklı background, bölümlerin farklı olması başta zaten güzel hocam. …

> There was a capacity activity which they did, related to cube. However, all of them did the same thing. I liked it when I first saw it. There was a girl whose name began with Z. I think S6 sent it. I don't know exactly. There was her activity. Then, all participants sent the same activities. I criticized this. Why were all of them the same? All of them bring sugar lump [to the classroom for lesson plan]. Maybe, this example was in their books. I don't know. We generally mathematics teacher bring [only] cubes to the class. [However,] sugar lump is more vivid example. Firstly, different background and department is very good anyway. (S26, from AU, I).

However, three participants claimed that there were poor comments coming from the participants attending other universities. One participant said,

> Bu konuda söylemek istediğim şey daha önce de belirttiğim gibi farklı bölümlerde olmamız. Onların bölümü Sınıf Öğretmenliği olduğu için daha fazla alana yönelmek zorundalar. O yüzden Matematik dersiyle ilgili çok ayrıntılı yorumlar gelmedi ne yazık ki… Bunu onları eleştirmek için söylemiyorum. Ben de Sınıf Öğretmenliği Bölümü'nde olsam ben de aynı durumda olacaktım.

> The thing I want to say on this topic is that, as I said before, we are from different departments. Because their department is elementary education they focus on more different teaching areas. Therefore, unfortunately, there weren't detailed comments related to mathematics education. I didn't say this to criticize them. If I was from elementary education I would be in the same situation. (S7, from METU, R).

Not wanting to enter a fight

Two participants said that their personality affected their contribution to discussions. One of them said that she was an introvert person. It was not easy to interact with people who did not know before. Therefore, she did not prefer to talk with other university students in a discussion. She sent only their comments and replied her own friends' comments. The other stated that she hesitated to dispute with other university students. Therefore, she did not discuss on any topic with them even if she had reverse ideas to their opinions. She said,

> Onlarla ilgili paylaşımlarım maillerini okumaktan ötesine pek geçmedi bunun nedenine gelince genelde düşüncelerini yazdıklarını beğenmem ve benimde aynı görüşte olmamdı. Tabi ki görüşleri hakkında farklı düşündüklerim de oldu ancak işin açıkçası biraz tartışmaktan kaçınmamdı. Öz eleştiride bulunmak gerekirse biraz tartışmadan çekinen düşüncelerimi pek paylaşmayan bireyim. Ancak benimle ilgili her türlü eleştiriye açığımdır. Bunun yanı sıra başkalarının görüş ve eleştirilerini okumaktan ve dinlemekten büyük bir zevk alırım. Ancak karşı fikirlerimi söylemekten biraz çekindiğimi itiraf edebilirim… Ben kendimi grupta neler yapılacağı, nasıl olması gerektiği konusunda çok soru soran bir birey olarak görüyorum. Bu karşılıklı konuşmalarımı diğer üniversiteden arkadaşlarla da yapsaydım eminim çok daha etkili şeyler olacaktı.
>
> My sharing with them is only by reading their e-mails. The reason was that I liked to their writings and I had similar ideas. Of course, there was times which I thought in different. In fact, I avoided to dispute. I am a person who avoid to dispute and not to share her ideas. However, I am open to be criticized. In addition, I enjoy to listen and to read others' criticizes and views. However, I acknowledge that I hesitated to state reverse ideas. I see my self is a person who asks lots of questions about what can be do in the group, how it can be. If I had made this face to face taking with other university students, it would have been more effective results. (S18, from COMU, R).

Lack of time

Almost all participants stated that they had limited time to participate to the discussions. Especially, they emphasized that they had to take the teacher enterance exam and had graduate from their universities. One of them said,

> Üniversite 4. sınıf olmamızdan dolayı, zamanımızı oldukça verimli kullanmamız gerekmektedir. Bir yandan okulda verilen ödevler ve yapacağımız sunular, diğer yandan da öğretmen olmamızın önündeki engel olan KPSS sınavına çalışmamız gerekmektedir.
>
> Because of being fourth grade we have to spend our time more effectively. In addition to homework and presentations, we have to work for KPSS, an obstacle for being a teacher. (S20, from AU).

Unwillingness and involuntary participation

It was observed that the participants who were willingness to contribute to the environment wrote more detailed comments to send the discussion list. In addition, according to five participants, willingness and voluntary participation was an essential factor to increase the quality of the discussions. They thought that if the participants had contributed the environment, voluntarily, they would have sent more useful and quality e-mails to the discussion list. Two of these participants stated that they were forced to contribute the discussions by grading and grading had a negative affect on them. They underlined the importance of willingness during the discussions.

> …Buranın bir ders yeri olduğu düşüncesini aşamamış olduğumuzu görüyoruz. Belkide bunun nedeni bizim not kaygısıyla bu siteye girip birşeyler yazmamızdı. Bence bu site not kaygısıyla gelmeyen eğitimciler tarafından ziyaret edilse daha kaliteli ürünler ortaya çıkar.
>
> It could be seen that we didn't overcome the idea which this environment was a part of a course. Maybe, the reason of this was that we login the web site and write on it because of grade anxiety. In my opinion, if the web site was visited by educators who participate in the environment without any anxiety, more quality outcomes would have came out. (S10, from METU, R).

> Hazırlanan çalışmaların öncelikle gerçekten isteyerek yapılması gerektiği gerçeğiyle tekrar karşılaştım. Ayrıca bireye ne kadar bilgi vermek, ne kadar onun içinde çabalamak istesen de, o bunu istemedikçe bir şeyleri göstermenin, öğretmenin zor olduğunu gözlemledim.
>
> I again faced the fact that the studies prepared should have been made by voluntarily. In addition, evenif whatever you want to teach a person or whatever you try to do the best for a person, I observed that teaching something and lighting their way is hard job if she/he doesn't desire this. (S23, from METU, R).

Unread prior comments

The degree to which incoming mails were read was another factor which affected the quality of the messages. According to four participants, there were some participants who sent some of their comments without reading prior messages. However, two participants stated that they had waited until the last minutes of the discussions since they wanted to compose their e-mails after examining previous ideas.

Two participants with diverse ideas said,

> Önceden gelen yorumları okumadan gönderilmiş yorumlar vardı. Bazen hep aynı yorumu okuyormuşum gibi geldi.

> There were some comments which had been sent without reading prior comments. I felt as if I read the same comment.(S7, from METU, R).

> Kendimi grupta aktif bir eleman olarak gözlemledim diyebilirim tartışmalarda genelde yapıcı olmaya çalıştım ama genelde yorumları son günlere doğru yazıyordum sebebi ise diğer arkadaşlarımın neler yazdığı okumak istememdi. Bu sekilde yorumlarımı güçlendiriyordum.

> I observed myself an active member of the group. I tried to be positive in the discussions. However, I generally wrote my e-mails in the last days of discussion period since I want to read what the others had written. (S3, from METU, R).

Low priority in their life

It was observed that the PDC was a secondary priority in the participants' life. Eleven participants, in their reflection reports, often stated that the KPDS, their other courses, other entertainment (the group of folks, chatting with their friends. etc) are reasons of their low contribution to discussions. A participant said,

> Haftada 4 gün KPSS kursu 5 gün okulun olması nedeniyle aşırı yorgunluk ve zaman sıkıntısı yaşadım. Haftada 4 gün eve gece 23.00'te geliyorum… Bu çalışma geçen yıl olsaydı ya da bu yıl üzerimde KPSS yükü olmasaydı çok eğlenceli olabilirdi. Keşke ekonomik kaygılar ve atanamama korkusu yaşamasaydım ve bu çalışmadan zevk alarak uygulamaya katılsaydım. Bu koşullar altında bu kadar katkı sağlayabildim.

> Because of four days in a week for KPSS course and five days in a week for university education, I was tired too much and I had limited time. If I wish this study had been in the last year or I wish I had not get the KPSS, this study would have been more entertaining. I wish I had not feel economic anxiety and participated in this study, gladly. Under these conditions, I contributed this much. (S25, from AU, R).

During the interviews, the researcher asked the reality of this reasons. All of the interviewees did not agree with these ideas. One of them said,

> O insanları da tanıyorum 5 seneden beri hani her tür konuda bu şekildeler. Hani bazı şeyleri önemsemiyorlar. Onlar için bu ders öncelikli sırada yer almıyor. O yüzden de katılmıyorlar.

> I know those people. From five years, they are like this. They didn't care something. This course has not a priority in their life. Therefore, they didn't participate in. (S4, from METU, I).

Another student from different university said,

> Herkes Kpss ye çalışır mı? Allah aşkına. Yani ben bile o kadar fazla zaman ayıramıyorum. Vizelerden sonra ödev hazırlıyoruz şu an hiç ben bile 1 saat 2 saat çok zor çalışıyorum zaten. Herkes çalışmıyor. Bir çok kişi sınavı göz ardı etti zaten. Okul bittikten sonra tekrar devam ederler belki çalışmaya ama zamansızlık değil. Önem vermemek, ilgilenmemek.
>
> Does anybody study for KPSS? That is, even I can not have much time. After examination we are preparing homework and now even I hardly work only 1 or 2 hours. Anybody does not study. Many already abandoned the exam. After graduating from the university, maybe they will study. But it is not inopportuneness. It is disregarding or miniminazing. (S15, COMU, I).

Familiarization with ICT

The participant's familiarization with Information and Communication Technologies (ICT) has been an important factor which affected the quality and amount of discussions. Five participants emphasized in their reflections that they were not used to using computers, very much. They, therefore, proposed to take another computer literacy course prior to this project even though they had taken a computer literacy course in the second year of university education. To be able to explain this contradiction, a question about the effectiveness of the computer literacy course which they took before was asked to some of the interviewees. The student, from AU, explained that the prior computer literacy course was very poor. Its instructor was generally ill and so their friends did not benefit from the course very well. This situation was the same for COMU students. They also had not used computers very well since their computer facilities were very limited in their university. However, although the METU students said that there was a computer literacy course and they had opportunities to use computers, some of them did not like to use computers and they did not want to familiarize themselves with this technological tool. One of the interviewee said that she had negative attitudes towards computers. Therefore, she did not participate to the Forum (a voluntary part in PDC portal).

> Hani sınıfta, birazcık şöyle benim için bire bir belki de bulunmak derste bana göre biraz daha cazip geliyor. Online da benim birazcık şey problemim var. Çünkü bilgisayara karşı çok negatif yaklaşımım, tutumum vardı ilk buraya geldiğimde. Bunu yavaş yavaş yendim, yenmek durumundaydım ama yine de mesela forumlara hiçbir zaman katılmadım ben mgc de.
>
> One to one being in the classroom is more appealing for me. In online environments, I have a problem. Because, I had a negative attitude towards

computers when I first being here. I overcame this step by step. I had to overcome. However, I never participated to forum in PDC portal. (S9, from METU, I).

In sum, poor computer literacy courses which did not contribute effectively to pre-service teachers and poor computer use opportunities caused unfamiliarity with computers. These reasons and negative attitudes towards computers decreased the quality of the messages.

In her reflection report, one participant stated that they felt not good at computers and thus they did not understand reasons of some technical problems which they faced with. During the discussions, lots of students, in the beginning of the term, posted e-mails to the researcher about why their e-mails had returned back and whether or not their e-mails had been distributed to the discussion list. In this situation, the researcher observed that there were two participant types. First participant type tried to overcome these problems and finally when they solved their problems they were reinforced. However, most of the participants were frustrated when they faced a problem and their performance decreased. Therefore, their e-mails and so discussion quality decreased. One of the participants said,

Bilgisayarla aramın pek iyi olmaması ve özellikle de attığım maillerin hata bildirimi verip geri gelmesi performansımı olumsuz etkiledi.

I am not good at computers and especially returning error replies to my e-mails affected my performance negatively. (S15, from COMU, R).

Another participant who overcame the problem on his own mentioned how he noticed the problem, found its reason and sent an e-mail to the researcher.

Hocam ben S17. Dün size maili ---@xx.xx adresimden yolladığımı zannediyordum ama bügün farkettim de o adresten mailler gidiyor ama karşı tarafa ulaşmıyormuş. Yeni mail açtim eğer değiştirirseniz sevirim. Artık bu mail adresine gelmesini rica ediyorum sizden.

Mrs. Baran, I am S17. I thought that I had sent e-mails from my ---@xx.xx e-mail account. However, I, now, noticed that e-mails were sent through this account but did not reach to other participants. I have gotten a new e-mail account, yet. If you change my account, I will be happy. Could you please arrange that discussion e-mails reach my new account. (S17, from COMU, October 10, 2005, 14:22).

In addition, the METU students were more capable to determine and solve their technical problems which they lived during the discussions. They stated their problems more clearly to the researcher and so the researcher solved more instantly the problems. However, the other two university students generally had problems with technology. For example, one

student from these universities stated that he got his first e-mail account owing to this project. He said,

> Kendi grubumda açıkça söylemeliyim ki pek başarılı bir eleman olamadım projeye yeterli katkıyı sağlayamadım bunun tek sebebi benim Internet kullanıcılığımdaki becerisizliğim. Benim ilk mail adresim bile bu proje için oldu. Onun için bir çok zaman videoları izleyemedim bazen yorumlarımı yollamakta zorlandım.
>
> Explicitly, I could not be a successful member in my own group; I didn't contribute to the project very much. The only reason of this was my incompetence with Internet use. My first e-mail account was got for this project. Therefore, generally I could not watch the videos and sometimes, I demanded to send comments. (S18, from COMU, R).

S23, who is an active member of the AU students, evaluated her friends' technology use level,

> Her şeyden önce Teknoloji kullanımına dayalı olarak gerçekleştirilen bu süreçte teknoloji kullanımı ile ilgili sıkıntılar yaşandı, bunlar kesinlikle arkadaşlarımın ön öğrenmeleri ile ilgili diye düşünüyorum.
>
> In the beginning, in this process which accomplished by means of technology, there were some problems related to technology use. I think that these problems were definitely related to my friends' prior knowledge. (S23, from AU, R).

One of the interviewees said that writing with keyboard was very time consuming. Thefore, she did not send e-mail to her friends even though she wanted to tell something to them. Indeed, her evaluation of writing with computers shows her low technology uses ability. She said,

> Bir defa bizde şunu söylemek gerekli sanırım, şu an onu daha iyi anlayabiliyoruz. Gittiğimiz okul kötü bir okul olunca, öğrenciler kirleniyor mesela. Bu sene öğrenciler vardı kurt oyununda matematik dersinde. Acayip eleştirmişiz. Şimdi farklı düşünüyorum "Ya bırak Allah aşkına burada da kirlensinler." Zaten pis çocuklar işte. Aileler ilgilenmiyor filan. Daha farklı şu an ama burada her düşündüğünüzü onlara iletemiyorsunuz. Online ortamın en kötü şeyi bu yani. Yani sonuçta oturup bilgisayarda yazı yazmak özel vakit ayırmak isteyen bir şey yani özel bir vakit ayırmanız gerekiyor. O yüzden her düşündüğünüzü iletemiyorsunuz. Arkadaşlara bu düşüncemi geri göndermek istiyorum aslında boşu boşuna yargılamışız arkadaşları.
>
> First of all, I have to say that we, now, more understood this. When the [practice] school which we went is poor, students get dirty. There were students in wolf sheep game [period 1]. We criticized very strictly. Now, I think different about it. "omit it, let children be free. They are already dirty. Their families does not interested in

> their children. Now, it is more different. But you can not tell every thought to them [in internet environments]. The worst thing is in online environments. That is, as a result, writing with keyboard requires a special time. In other words you have to allocate a special time. Therefore, you don't tell every thought. Indeed, I want to send this idea to the others. We had judged them in vain. (S15, from COMU, I).

According to two interviewees, asynchronous communication decreased the number of comments since everyone did not connect to the Internet in the same time. If it passed a long time over a comment, a member would not want to talk about this comment. One of the interviwee said,

> O anda hani bireysel karşılıklı… Bazen siz yorum yazıyorsunuz. Bir daha üzerine kimse konuşmak istemiyor. Ya da sürekli hani girmediği için internete bir şey söylediğiniz zaman karşılığı gelmiyor.
>
> [In face to face environments] everything is individual, mutual. [In the internet environments] sometimes you write a comment and nobody does not want to talk about it. Or since nobody did not connected to the Internet always, when you tell something, the reply to it is not sent (S4, from METU, I)

Another participant also said,

> Orada da soruyu sorabilirsin ama hani yüz yüze olduğunda, biraz zaman kazanacağız, daha bir hızlıyız. Orada sorduğumuzda ise cevap gecikebilir.
>
> You can also ask in [the Internet environments] but in face to face [environments] we gain more time, are fast answering. [In the Internet environments], the answer can delay. (S23, from AU, I).

Working habits which was one of the factors influencing the quality of the e-mails affected the number of the mails sent by the participants. Five participants stated that they stick to their traditional working habits. For example, one student complained that computer based environments did not provide good working environments which were similar to her familiarized working habits. Absence of traditional tools has directly affected the number of her e-mails. She said,

> … benim kısa yazmamda ki bir diğer neden ise bilgisayarda yazı yazmaktan hiç hoşlanmamamdır. Genelde ben ders çalışırken yazarak çalışırım ve elde yazmak renkli kağıtlar, kalemler kullanmak çok hoşuma gider. Bilgisayar bu konuda beni sınırladığı için bilgisayarda yazı yazmaktan pek hoşlanmam. Bu da benim arkadaşlara gönderdiğim postalarımı etkiledi.
>
> Another reason of my short writing is that I don't like to write on the computer. I generally study by writing while I am studying and I like to use hand writing, colorful paper and pencil. Since the computer limits me to use these tools, I don't

like to write on computers. This situation affected my mails which I sent to my friends. (S18, from COMU, R).

During the interview, another student also stated their unfamiliarity with studying by technological tools.

İlk başta daha böyle bir zor çünkü alışkın değiliz. Sürekli onu takip etmek. Maillere sürekli bakmak. O yüzden zor geldi

In the beginning, it was difficult. We do not get accustomed to follow [e-mails] permanently, to read [e-mail] permanently. Therefore, it was a hard job. (S4, from METU, I).

Internet access

Three participants from AU and two participants from COMU claimed in their reflection reports that they had problems to access to the Internet although they had a laboratory hour for this application. They wanted to watch videos in their home or Internet café. Internet access from only laboratory has been a limitation to contribute to discussions for them. One of them said,

Hocam, benim en büyük sıkıntım Internete ulaşımdaydı. Her zaman laboratuvara gitmiyorduk. Evimizde bilgisayar zaten yok. Internet cafelerde cok sıkıntılı oluyordu. Bu durumda her aktiviteye katılmam mümkün olmadı.

Mrs. Baran, the biggest problem was Internet access problem for me. We didn't go always laboratory. We do not have any computer in home. There were lots of problem with Internet cafes. In this situation I can not contribute every activity. (S13, from COMU, R).

The Length of the discussion periods

The term was divided into four periods of two weeks for discussions: one week for comments and replies to these comments and the other week for sending lesson plans. There were different ideas about whether or not the length of the discussion periods. According to the researcher' observation this difference is because of the participants' technical capability and willingness. For example, four participants criticized that periods with two weeks were too short to make effective comments. These participants' technology capabilities were not high and some of them also did not willing to contribute. For example, one said,

> Belki yorumlar için daha geniş süre verilseydi daha güzel yorumlar yazılabilirdi.
>
> Maybe, if the length of the discussion periods had been longer, richer comments would have been written. (S24, from AU, R).

However, one of the interviewees said that she wanted to watch more videos. This participant was one of the most active students in the discussions. In addition, she made interesting activity proposals to the lesson plans and appreciated by other participants. She said,

> Bence çok yorucu değildi. Sonuçta bir videoyu izledikten sonra bir hafta içerisinde yorum yazıyorsunuz. Bir hafta sonrada diğer grup ona yorum yazıyor ya da… bir sonraki videoya kadar 2 hafta, 3 hafta geçiyordu zaten. Daha da sık olabilirdi.
>
> In my opinion, it was not very demanding. As a result, after watching the video, in a week you should write a comment. After one week, the other group writes a comment up to following video. 2 or 3 weeks passed in this duration. It can be more frequently (S4, from METU, I).

The Three e-mails rule

One of the most discussed topics was about the three e-mails rule. The participants had to contribute to the PDC with minimum three e-mails. They criticized that this obligation caused ineffective comments, similar comments and messages which were irrelevant to the discussion topics. However, nine participants emphasized the importance of obligation in pre-service teacher education and said that this obligation leaded to deeper understanding of the practice. In this part, this tension among participants will be explained in more detail.

Negative results of this obligation

According to reflection reports, the three e-mails rule caused to following negative results, 1) ineffective comments, 2) dividing whole opinions into smaller parts, 3) similar messages, and 4) out of topic e-mails.

The general opinion of these participants was that the three e-mails rule caused ineffective comments. One student said,

> Bu tartışma ortamının daha etkili olması için açıkçası üç tane mail gönderme zorunluluğunun ortadan kalkması gerekli bence. Çünkü yapılan tartışmalara yönelik derli toplu bir şekilde yazılmış bir mail bile yeterli olabilir fakat üç mail zorunluluğu olunca insanlar kestirme mail atma

yolunu tercih ettiler. Örnek vermek gerekirse "sadece arkadaşların anlattıklarına katılıyorum" şeklinde

To make this discussion environment more effective, the three e-mails rule should be removed, because one e-mail which is properly written can be sufficient. However, people preferred a shortcut e-mail in the three e-mails rule. For example, in the form of "I agree with my friends' opinions". (S5, from METU, R).

Three participants stated that they could not manage their stress because of the rule and they preferred to divide their whole opinion into smaller parts. One of them said,

…Çünkü ben kendi açımdan üç yorum yazmam gerektiğini düşününce stres olup, düşüncelerimi tam anlamıyla ifade edemedim. Üç yorum yazmam gerektiği için düşüncelerimi bölerek yollamak zorunda kaldım ve kendimi tam anlamıyla ifade edemedim.

Because for me, when I thought about the three e-mails rule, I was stressed and could not express my opinions completely. Since I had to write three e-mails, I sent my opinions by separating and could not expressed myself completely. (S27, from AU, R).

Four participants claimed that they had to send similar messages to previously sending comments. One of them said,

…Bende bir yorum yapsaydım diğer arkadaşların yazmış olduğu yazıların sonucunun aynı olduğu, sadece yazım tarzının farklı ve bir de e-mail adresinin farklı olduğu bir yazı daha olacaktı.

If I had a comment, there would have been a message which was the same as the results of the other friends' e-mails and which only included different e-mail address. (S22, from AU, R).

Two participants stated that they had sent irrelevant messages to the discussion list. One said,

Üç yorum gönderme şartı yüzünden pek alakalı olmayan yorumlar gönderdiğim oldu.

I sometimes sent irrelevant comments because of the three e-mails rule. (Mustafa, from METU, R).

According to two participants, the three e-mails rule was a heavy task because of their limited time. One of them stated,

> Özellikle üç yorum yazma şartı bizi epey zorladı. Her zaman videoları seyredip üç yorum yazabilecek kadar vaktimiz olmuyordu bu da bizim yaptığımız yorumların kalitesini düşürüyordu
>
> Especially the three e-mails rule was demanding for us. We didn't have much time to watch the videos and to write comments. So, the quality of our comments decreased (Mustafa, from METU, R).

Positive results of this obligation

In addition to negative results of the three e-mails rule, positive results were also stated. In their reflection reports, three participants pointed out that if there had not been any obligation they would have sent only one or no e-mail to the discussion list. When the all interviewees were asked how they evaluated this tension they supported positive results of this rule. They said that, otherwise, most of their peers would not have sent any comment. In sum, they stated that this obligation was very important in pre-service teacher education. Two participants said,

> Öncelikle uygulamanın ders çerçevesi içerisinde olması bence oldukça etkili oldu diye düşünüyorum. 3 mail zorunluluğu birçok arkadaşıma saçma olarak geldiyse de bence gayet mantıklıydı yoksa herkes bir mail atıp olayı kapatacaktı.
>
> Firstly, I think that the fact that sending three mails was a must of this course made the application effective. Although most of my friends found the rule nonsense, in my opinion, it was reasonable. Otherwise, everyone would send only one e-mail and finish their responsibility. (S3, from METU, R).

> Üç mail kısıtlaması bizim için daha yararlı oldu; çünkü üç yorum yazabilmek için konuyu çok daha derin düşünmek ve gelen yorumları çok daha iyi analiz etmek zorunda kaldık. Bu da düşünme ve yorum yapabilme becerimizi geliştirdi. Bu tarz bir portalın mesleki gelişim açısından bireylere çok şey kazandırdığına inanıyorum.
>
> The three e-mails rule has been more efficient for us because we had to think deeply and to analyze more efficiently coming messages to be able to write three e-mails. So, our abilities of thinking and making comments developed. I believe that this kind of portal contributed a lot to individuals' professional development. (S11, from METU, R).

Another participant explained how she planned to send comments after watching videos

> Ya o 3 mesaj için farklı açılardan baktım. Yani kendimce öyle bir plan oturttum. Yani hani sınıf öğretimi, matematik etkinliği, bir de başka bir sınıftaki başka bir durum. Yani bunları ayırıp, bunları önemseyip etkili bir şekilde katıldığımı düşünüyorum.
>
> I looked [the videos] from different points for 3 messages. That is, I made a plan for me. That is, classroom management, mathematics activity and another case from a different class. I thought that I participated effectively since I divided and valued these. (S9, from METU, I).

Their suggestions

As a result of these positive and negative criticize to the rule, the participants made some suggestions. Even though there were a few students in favor of sending only one e-mail and although some students said that the participation count should have been self regulated, most of the participants (six students) supported the two e-mails rule. To them, the first e-mail should include students' comments and the other should consist of replies to other students' messages. One participant said,

> …Yapılan etkinliğe bir yorum ve yapılan ilk yorumlara ikinci yorumlar yazılması yeterli olurdu sanırım üçüncü maillere gerek yoktu diye düşünüyorum. Böyle olursa hem de daha fazla videoyu inceleme fırsatı bulabilirdik. Böylece bu çalışma daha verimli olurdu kanısındayım.
>
> I think that a comment for the [video] activity and a second comment to the first comment may be sufficient. Third e-mails were not necessary. In this way, we would have an opportunity of examining more videos. So, this study would have been more efficient. (S2, from METU, R).

Watching video

The participants stated that they cannot send their comment since they cannot watch the videos. There were two problems to impede watching the videos; 1) streaming of the video, 2) pop up blocker error, and 3) voice of the videos.

Related to first problem, nine participants, who were from COMU and AU, stated that they wanted to access the videos from Internet cafe or a home computer instead of using laboratory hours. So, they had low Internet access to stream the videos. METU students did not have any problem with watching videos since they said that they accessed to the Internet from both faculty laboratory and their dormitories. Two participants from AU and COMU said,

> Dönem boyunca, MGÇ ile ilgili karşılaştığım teknik problem sadece video izleme konusunda oldu, kullandığım bilgisayarlar videoyu açmıyordu.Videoları arkadaşlarım sayesinde izledim burada problemin çoğu bendeydi galiba.
>
> During term, the only technical problem with PDC which I faced with was about watching videos. The computers I used didn't work videos. I watched them owing to my friends. In this situation, most of problem is mine. (S22, from AU, R).
>
> Videoların izlenmesi aşamasında teknik problemlerle karşılaştım çoğu zaman. Bir keresinde Internet cafeden bağlanıyordum cünkü laboratuarta temizlik vardı. Bazı videolarda görüntüler dondu. Kafenin sahibi de ilgilenmedi.
>
> I had some problems while I watching videos. At a one time, I connetted to Internet from an Intert café because it was cleaning time in the laboratory. Images in some videos were frozen. Owner of the internet café did not interest in. (S18, from COMU, R).

The second problem was that they could not added the period's video in their personal user account although they have a guide which were distributed to them in the beginning of the term. They had a pop-up bloker error but they did not understand that they had this problem. Therefore, the researcher re-sent them pop-up bloker guide to these participants.

The last problem occurred in only AU was related to voice of the videos. In the second period, two participants sent e-mail related to this problem to the researcher. One participant asked following question,

> Merhaba hocam, Ben videoyu izleyemiyorum. Çarşamba günü okulda sessiz bi şekilde izlemiştim. İzleyebilmem için ne yapmam gerekiyor? İyi akşamlar.
>
> Hi Mrs Baran. I didn't watch the video. On Wednesday, I watched it with no voice. What can I do to watch it? Goodnight. (S21, from AU, 13 Oct 2005 20:23:47).

After one week, this problem which was sent by S21 also came to the researcher from the other AU students during the researcher's visiting to the face to face meeting of AU students. Although the researcher focused on complex video problems, the answer of this problem was too simple. The participants did not hear any voice from the videos since the computers did not have any speaker. All speakers were removed by the laboratory administrator since students could disturb with each other by turning up the volume of the

speakers. Because of nonexistence of speakers in the laboratory, the researcher distributed earphones to all participants at the beginning of the term. However, it was interesting that the participants did not know how to use earphones. Furthermore, at the first meeting, none of them did not asked any question about how they would use earphones or what they would do these tools during the project. During the researcher's visiting of the class, the participants found a solution for this problem themselves. They brought speakers to the class and put earphones on speaker to be able to hear voice. In her reflection S21 stated,

> Video izlemekteki problemler yüzünden grubumun etkili olduğunu düşünmüyorum. Bir kaç kere sınıfa hoporlor getirdik. Teknolojiyle uğraşmak kolay değil çünkü biz bu konuda bilgili değiliz.
>
> I don't think that our group is effective because of problems of watching video. A few times we brought speaker our class. Technology was a hard job for us since we were not good on it. (S21, from AU, R).

Another student from AU also stated the same problem,

> Bizlere kulaklık dağıttınız ama biz kulaklığı kullanamadık. Çünkü kasanın arkasında kulaklık girişi olduğunu bilmiyorduk. Internet kafede videoları izlemek için en az 5 bilgisayara oturdum ama hiç birinde izleyemedim. Yani internet kafede hem ses hem görüntü yoktu okulda ise ses yoktu
>
> You distributed earphones to us. However, we can not use them since we didn't know that there was a place to put them on the back of the computers. In Internet cafes, I changed five computers to be able to watch the videos but I was not successful. In an Internet café, both voice and image were missing. (S25, from AU, R).

During the class visiting, AU students mentioned that they generally demanded by this problem. It impeded them to watch videos effectively and to contribute more willingness to the environment.

Discussion list use problems

The researcher replied to 26 e-mails coming from 13 different participants in the beginning of the term, October, 05-10, 2005, since the participants did not know how to use discussion list. Five participants from COMU, six participants from AU and two participants from METU sent their first meeting e-mails to the instructors' personal e-mail address by mistake. That is, their first introducing e-mails were not distributed through the discussion list. Therefore, the researcher sent an e-mail to each of them about what they would do so

that their e-mails could be distributed through the discussion list. Another indicator which supported that the participants did not know how to use discussion list was that some of the participants could not understand whether or not their e-mails were distributed to other participants. Eight participants sent the same e-mail one more time to discussion list. Consequently, after the middle of the second period, there was not any e-mail coming to the researcher about this problem since the participants learned how to use discussion list.

4.4.3. Summary

This part of result section presents a shot statements obtained from results (Table 4.17). First, forcing reasons to contribute to the environment were summarized. Under this heading, the issues "supporting own university students' ideas, gaining reputation, questions and answers, self confidence and having wide ranging knowledge, readiness level for life long learning, having diverse ideas, citations from original comments, transmission of prior knowledge, quality of cases, advantage of the Internet environments" were investigated. Second, the reasons affecting the quality of discussions and reasons of low participation in discussions were investigated. These were "Depertmental diversity, not wanting to enter a fight, lack of time, unwillingness and involuntary participation, unread prior comments, low priority in their life, familiarization with the Internet, Internet access, the length of discussion periods, three mails rule, watching video and e-list use".

Table 4.17

Summary of mandatory participation term

The Driving Reasons Which Forces to Contribute to The Environment
During the discussions, some reasons forced the participants to contribute to the environment. These were;

• Supporting own university students' ideas
  o Some preservice teachers supported their friends' ideas.
• Gaining reputation
  o The participants thanked owners of the messages for their interesting or succesfull activity proposals.
• Questions and answers
  o Group members asked some questions to other participants to learn their opinions on specific topics.
  o During the discussions, all questions were answered by the participants.
  o The type of questions also affected the number of answers. Some questions were valuable while some were nonsense for them.
• Self confidence and being sophisticated
  o If a pre-service teacher had believed him/her self he would have not avoided putting his/her opinion in front of the other people.
• Readiness level for life long learning
  o The participants who were life long learners contributed more than the others
• Having diverse ideas
  o Having a diverse idea related to video activity forced the participants to write on this topic.
• Citations during the discussion
  o The participants generally cited other participants' ideas. Reason of citation was agreement or disagreement.
  o Citation of a comment did not force the owner of the comment to reply this mail. Most of the mutual discussion generally finished after this point.
  o The participants used a general addressing, a subject or an opinion to cite.
• Transmission of prior knowledge
  o They transmitted their prior knowledge to the environment. Therefore, they could make richer comments.
• Quality of cases
  o Existing teaching problems in the videos caused to increase the number of the messages coming from the participants.
• Advantage of Internet environments flexible interaction
  o Some participants said that they told their opinion in the Internet environment more comfortably.

Table 4.17. continued

The reasons decreasing quality and amount of discussions

During the discussions, some reasons affected quality of discussions.

- Departmental diversity
    - The participants stated five different views about the effectiveness of departmental diversity on the quality of discussions:
        - similar studies from the same university students (the reason),
        - idea exchange,
        - wanting to benefit from the elementary school experience,
        - poor comments,
        - more effective comments depending on their departments
- Not wanting to enter a fight
    - Some participants hesitated to dispute with other university students. Therefore, they did not discuss on any topic with them even if she had reverse ideas to their opinions**.**
- Lack of time
    - Almost all participants stated that they could find hardly to participate to discussions.
- Unwillingness and involuntary participation
    - The participants who were unwillingness to contribute to the environment wrote less detailed comments to send the discussion list.
- Unread prior comments
    - There were some participants who sent some of their comments without reading prior messages. However, some participants stated that they had waited until the last minutes of the discussions since they wanted to compose their e-mails after examining previous ideas.
- Low priority in their life
    - It was observed that the PDC was a secondary priority in the participants' life.
- Familiarization with Information and Communication Technologies (ICT)
    - The participant's familiarity with ICT has been an important factor which affected the quality of the discussions.
    - Poor computer literacy courses which did not contribute effectively to pre-service teachers and poor computer use opportunities caused unfamiliarity with computers.
    - Negative attitudes towards computers affected participants' contribution to the discussion
    - Two participant types
        - First participant type tried to overcome these problems and finally when they solved their problems they were reinforced.
        - However, most of the participants were frustrated when they faced a problem and their performance decreased.
    - Some participants were not adaptive to use Internet based working tools (using keyboard, word programs to format text) rather than traditional working tools (handwriting, colorful

pencils, etc).

- Asynchronous communication decreased the number of comments since everyone did not connect to the Internet in the same time. If it passed a long time over a comment, a member would not want to talk about this comment.

- Internet access
  - Some of the participants had internet access problem.
- The length of the discussion periods
  - Some participants criticized short discussion periods
- The three e-mails rule
  - Some participants found 3 e-mail rule nonsense
  - Three e-mails rule caused following results
    - ineffective comments,
    - dividing whole opinions into smaller parts,
    - similar messages, and
    - out of topic e-mails.
  - This rule was reasonable for some participants to motivate the participants.
  - They proposed two emails rule instead of three e-mails rule.
- Viewing video
  - Some participants did not watch the video because of low speed internet connection and so they can not sent their comments.
  - Some students troubled to hear the voice of the videos since they does not know how to use earphones.
- Discussion list use
  - Some participants did not use discussion list. And thus can not sent their comments truly

4.5. The voluntary participation term

Third phase of the study started with the beginning of January and continued to the end of June. So, it is called as the Spring Term through the text. In this period, the community members discussed on four mathematics teaching topics on the discussion list. The topics were drama and geometry, fractions, multiple intelligence and mathematics and students attitudes towards mathematics. Detailed information is presented in the methodology section. The distinctive characteristic of this new term is its participants' voluntary participation to discussion list discussions.

In this part, the dynamics of this new environment will be examined. So, first of all membership history, message history, complexity of e-mails, coming message amount according to the parts of a day will be presented. Secondly, identity of preservice teachers, their evaluation of the voluntary participation term and comparison of the spring term with fall term will be discussed. The final part will include reasons which affected the quantity and quality of the discussion list discussions.

4.5.1. Membership history

In the voluntary participation term, membership to the online discussion environment has an increased trend. 177 newcomers joined among 36 members in mandatory participation term. That is, member count increased approximately five times in the new term. Figure 4.4 lets readers compare preservice teacher amount in both the fall and voluntary terms. After the fall term concluded, in January, 30 new preservice teachers participated to the environment. These preservice teachers are classmates of 11 participants from METU in the fall term. This new group also had the same mandatory PDC experience in the fall term. With the beginning of new term these two groups were combined. In the following months, there is a small amount of increase in the number of preservice teacher members. However, membership of inservice teachers' amount passed beyond preservice teachers' in progressing months. This result shows that inservice teachers are more eager to participate in these kinds of environments than preservice teachers being.

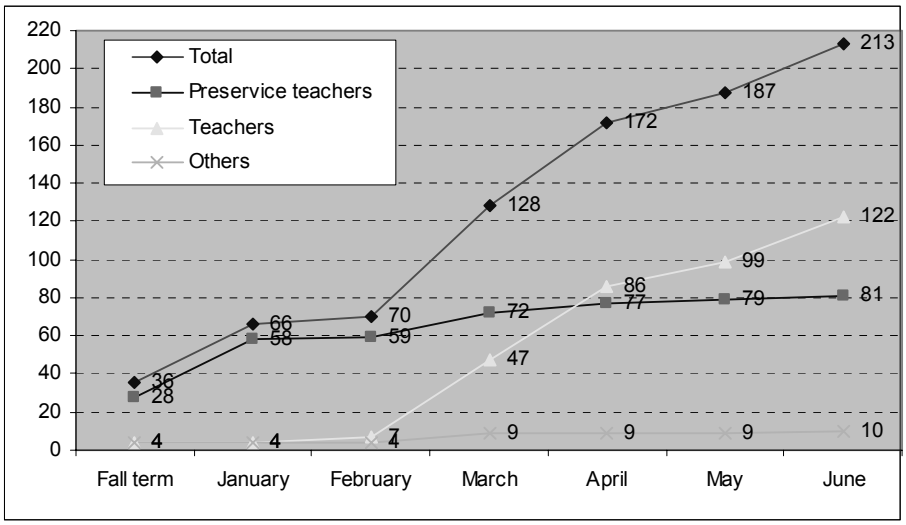


Figure 4.4 Membership history of voluntary participation term.

4.5.2. Message history

Total 219 messages were sent to the discussion list at the end of the term. Total message amount has an increasing trend with progressing months except for June. There were five messages in January, 14 in February, 49 in March, 48 in April, 79 in May and 24 in June. The detailed information was presented in Table 4.18.

Figure 4.5 shows coming message amount according to participant types. All participants except for the researcher had a similar behavior pattern. In the beginning, participation to discussions was low while in following months it increased and finally in May the contribution to discussions was the top. However, in June, there is a strict decrease in message amount. In addition, message amount can be seen according to participant types. At the beginning preservice teachers were more active than the others. In the following months, teachers' messages passed beyond preservice teachers' messages. This result may be related to increasing teacher amount. Also, while in the beginning the researcher actively participated to discussion with the aim of direction, in the following weeks her directive mails decreased but active participation to discussions topics increased (Figure 4.5).

Finally, the number of active participants to the discussions was explored. 23 teachers, 14 preservice teachers, two academicians and the researcher sent messages to the discussion list in this period. That is only 19 % of total members sent messages to the discussion list. In detail, four of preservice teachers in the fall term continued to discuss on mathematics teaching in this new term. Other three preservice teachers joined voluntarily

from other universities. The other preservice teachers were members registered in January by the researcher.

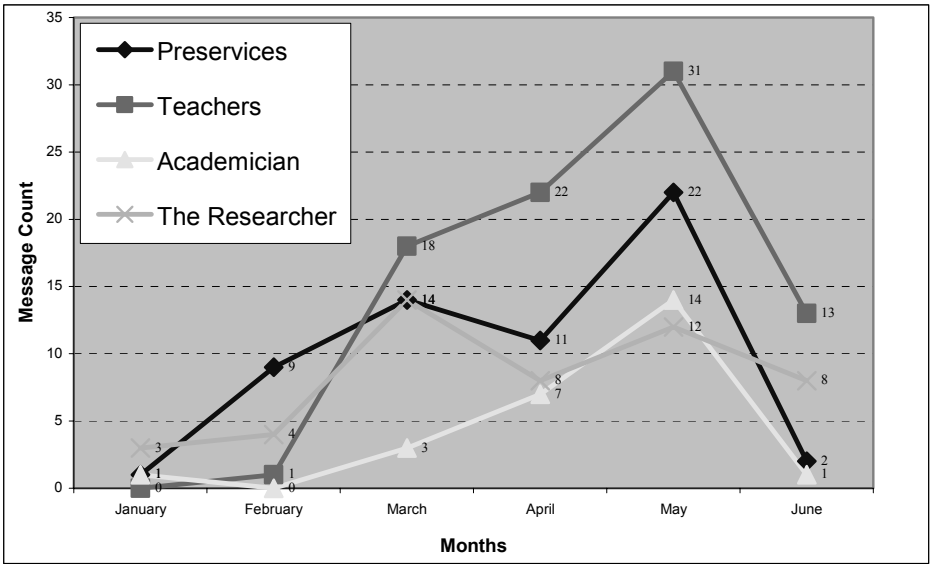


Figure 4.5 Message amount according to months and participant type.

Table 4.18

Messages according to months and member type

			MEMBER TYPE				
			Preservice T.	**Teachers**	**Academicians**	**The Researcher**	**Total**
Months	**January**	Count	1	0	1	3	5
		% within MONTH	20.0%	0	20.0%	60.0%	100.0%
		% within TYPE	1.7%	0	3.8%	6.1%	2.3%
	February	Count	9	1	0	4	14
		% within MONTH	64.3%	7.1%	0	28.6%	100.0%
		% within TYPE	15.3%	1.2%	0	8.2%	6.4%
	March	Count	14	18	3	14	49
		% within MONTH	28.6%	36.7%	6.1%	28.6%	100.0%
		% within TYPE	23.7%	21.2%	11.5%	28.6%	22.4%
	April	Count	11	22	7	8	48
		% within MONTH	22.9%	45.8%	14.6%	16.7%	100.0%
		within TYPE	18.6%	25.9%	26.9%	16.3%	21.9%
	May	Count	22	31	14	12	79
		% within MONTH	27.8%	39.2%	17.7%	15.2%	100.0%
		% within TYPE	37.3%	36.5%	53.8%	24.5%	36.1%
	June	Count	2	13	1	8	24
		% within MONTH	8.3%	54.2%	4.2%	33.3%	100.0%
		% within TYPE	3.4%	15.3%	3.8%	16.3%	11.0%
Total		Count	59	85	26	49	219
		% within MONTH	26.9%	38.8%	11.9%	22.4%	100.0%
		% within TYPE	100.0%	100.0%	100.0%	100.0%	100.0%

4.5.3. Complexity of discussion list messages

Discussion list messages were explored by each message's word count. This information give an idea on complexity of the messages since the size of the messages is directly related to the complexity of an e-mail (Barab, 2004; Hawkes & Romiszowski, 2001, Khan, 2005). Table 4.19 shows word amount in the e-mails according to member type. From January to June, the mean of e-mail word count was 188.25 for academician and this count was more than the others. In addition, word counts in e-mails of preservice teachers and inservice teachers were very similar (~74). Moreover, e-mails were examined according to months. This examination showed that the most complex messages came in May from the academicians. The preservice teachers made the biggest contribution in April and May.

Table 4.19

E-mail word count according to periods and participants

MONTH	TYPE	Mean	Std. Deviation	Min	Max	N
January	Academician	1.0	-	-	-	1
	The Researcher	111.0	-	-	-	1
	Total	56.0	77.7	1	111	2
February	The Researcher	92.5	125.1	10	275	4
	Preservices	88.8	79.5	10	219	8
	Teachers	10.0	.	-	-	1
	Total	83.9	90.0	10	275	13
March	Academician	22.0	2.8	20	24	2
	The Researcher	61.5	49.4	7	179	14
	Preservices	51.6	52.1	10	177	14
	Teachers	41.4	41.9	1	159	17
	Total	49.6	46.6	1	179	47
April	Academician	57.1	41.2	12	117	6
	The Researcher	101.6	74.4	20	239	8
	Preservices	96.8	102.8	2	285	11
	Teachers	72.8	80.3	10	323	20
	Total	81.7	80.6	2	323	45
May	Academician	286.6	266.9	6	888	14
	The Researcher	255.9	287.1	35	1018	12
	Preservices	76.7	70.8	4	254	22
	Teachers	83.7	105.2	2	394	31
	Total	143.8	193.4	2	1018	79
June	Academician	117.0	.	-	-	1
	The Researcher	114.8	55.7	38	203	8
	Preservices	16.5	10.6	9	24	2
	Teachers	103.2	86.3	15	235	13
	Total	100.4	74.4			24
Total	Academician	188.2	234.8	1	888	24
	The Researcher	130.7	169.1	7	1018	47
	Preservices	74.0	74.6	2	285	57
	Teachers	74.5	86.6	1	394	82
	Total	99.9	135.3	1	1018	210

4.5.4. E-mail amount according to main parts of a day

The researcher explored discussion list messages according to parts of a day. In this analysis, the main parts of a day are morning (06.00-00.00 am), afternoon (00.01-18.00 pm), evening (18.01-00.00 pm) and night (00.01-06.00 am). This information may be beneficial to understand when participants preferred to contribute discussion in online communities of practice environments. Figure 4.6 shows preservice teachers' e-mail sending percentage according to parts of a day. Table 4.20 shows all members' e-mail sending amount and percentage.

Preservice teachers sent 26.9% of total sending e-mails (see Table 4.19 in 4.5.2.). 32.2% of these messages were sent in the evening. Then orderly, the preservice teachers sent e-mail on afternoon (28.8%), at nights (23.7%) and in mornings (15.3%). Moreover, while in the beginning of the term there were some messages sent in the morning, in the following months, evening and night messages increased (Figure 4.6).

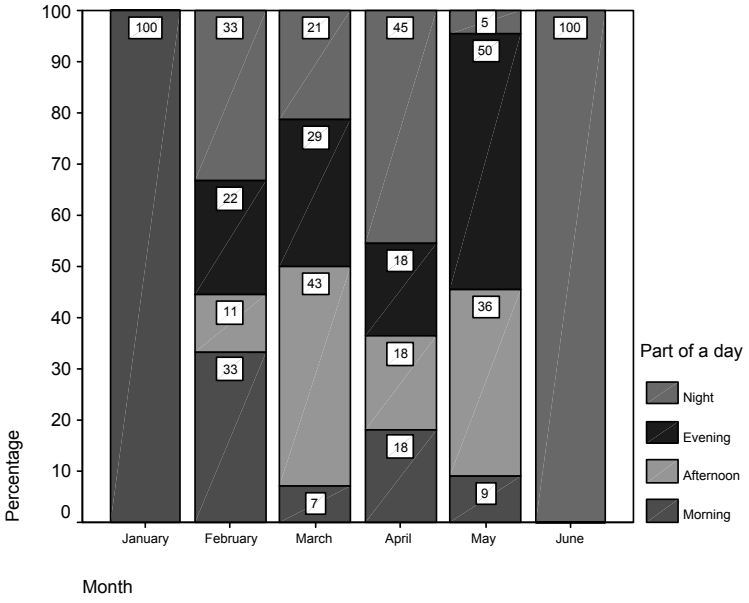


Figure 4.6 e-mail percentage according to parts of a day for only preservice teachers.

As whole, there are 78 e-mails on day afternoons and 64 e-mails in the evenings. That is to say that members generally sent their e-mails afternoons. According to months, e-mails sending time showed variance. While in the beginning the participants sent especially afternoons, through the last month, the count of e-mails which were sent at night and evening increased (Table 4.20).

Table 4.20

E-mail amount and percentage according to parts of a day for all members

			Parts of a day				Total
			Morning	Afternoon	Evening	Night	
MONTH	January	Count	1	3	1	-	5
		%	20.0%	60.0%	20.0%	-	100.0%
	February	Count	4	3	4	3	14
		%	28.6%	21.4%	28.6%	21.4%	100.0%
	March	Count	6	27	10	6	49
		%	12.2%	55.1%	20.4%	12.2%	100.0%
	April	Count	10	15	13	10	48
		%	20.8%	31.3%	27.1%	20.8%	100.0%
	May	Count	7	23	28	21	79
		%	8.9%	29.1%	35.4%	26.6%	100.0%
	June	Count	1	7	8	8	24
		%	4.2%	29.2%	33.3%	33.3%	100.0%
Total		Count	29	78	64	48	219
		%	13.2%	35.6%	29.2%	21.9%	100.0%

4.5.6. The participants' identity in the PDC

The researcher asked the interviewees how they accept themselves in the PDC environment in the spring term. They said that they were teacher candidates and the reasons of this are availability of more experienced teachers in the PDC, feeling not complete in field practice and professing a great esteem for more experienced teachers. The participants having above ideas said,

> Orada mesela bizim öğrenci olduğumuz belli oluyor. Öğretmen adayı olduğumuz. Daha farklı kişiler geldiği zaman, onların daha bilgili olduğunu hissediyorsunuz yazdıkları şeylerden.
>
> In the PDC environment, it is obvious that we are students. We are teacher candidates. When different people come, you feel from their writings that they are more knowledgeable than us. (S3, from METU, I).

> Yine öğretmen adayıyım. Tabi uygulamalar olduğu için o gittiğim okulla ve yaptığım uygulamalarla kıyaslayabiliyorum. Biraz da öğretmenlik edası olabilir ama yok daha hala öğretmen adayıyım. 1, 2 yıl böyle olacak sanırım. Bir şeyler yaparken hala ders anlatırken acaba çocuğa olumsuz bir şey veriyor muyumdur? düşüncesi var.

Again I am a teacher candidate. Of course, because we practiced anymore I can compare this with practices in the school which I attended. I a little feel as a teacher but no, I still a teacher candidate. It will continue for 1-2 years. While I am teaching a lesson, I still have a thought "am I teaching wrong things to children". (S15, from COMU, I).

Hala öğrenci olarak görüyorum hocam. Öğretmen olsam da hep kendimi bir adım geride. Saygıdan kaynaklanıyor diye düşünüyorum hocam. ben kendim doçent olsam bile o hoca ilk okul öğretmeni olsa makam farklı değil. Saygı farklı hocam. O yüzden insanları kendim bir adım geride. Fakat tabi sürekli takip eden bir öğrenci.

I see myself as a student. If I were a teacher I would be a step back. This is because of respectful. If I were an associate doctor and the man were an elementary school teacher, it would not be different. Respectful is different thing. Therefore, I am a step back of them. But of course I am a student who always follows. (S26, from AU, I).

4.5.7. The evaluation of the PDC

Four of the six interviewees said that they continued to follow discussions in the spring term in addition to mandatory participation term. The participants determined their reasons,

- Learning different things,
- Being keep up to date,
- Obtaining different opinions and ideas,
- Obtaining new perspectives,
- Belief modification,
- Learning the place of the theories in the practice,
- Confirming their ideas related to practice owing to experienced teachers.

Three of these participants exemplified "drama and mathematics" month to explain how this term affected their professional knowledge. This month had contributed their professional knowledge since they do not know how they can teach drama with mathematics. One of them said,

Ben neden takip ediyorum? Hem bu konuda bir şeyler öğrenirim diye takip ediyorum ve buradan gelişmeleri takip ediyorum işte. Açıkçası çok fikir veriyor. Dramayla işlenen bir ders açısından nasıl bir dersin dramayla işleneceğini… Aklımda kalıyor sonuçta. İlerde o konuyu işleyecek

olduğunda "Bak böyle bir şey vardı." Ya kendin ona uygun bir şey uyarlamalar yapabilirsin ya da onu kullanabilirsin. Ben çok yararlı olacağını düşünüyorum. O yüzden hepsini okumak istiyorum. Cevap yazamasam bile okuma gereksinimi hissediyorum.

Why am I following? I do so that I learn something and so I keep up-to-date developments. In all honesty, I got lots of ideas. For instance, how can be taught a lesson with drama? Consequently, it keeps being live in my mind. In the future, when you teach this topic you will remember that there was such things. You can modified it or you can use as is. In my opinion, it will be very beneficial. Therefore I want to read all of them. Even if I do not write an answer, I need to read them. (S14, from COMU, I).

Another interviewee told how her belief changed owing to discussions.

Ben drama konusuna döneyim. Bunları daha önce bilmediğim, tam hakkında bir fikrim olamadığı için olumsuz fikirlere sahiptim. Bunları uygulayabilirim, böyle şeylerde varmış şeyini gördüm ben orada. Drama, matematik. Hani bana daha zor hazırlanır gibi geliyor dramayla matematik. Hazırlanabileceğini gördüm ben orada.

Let me return drama. Because I do not know before it and I do not have any idea about it, I had negative ideas with its applicability. I understood that there were such things and I could put it into practice. Drama and mathematics. I thought that it was difficult to prepare such a lesson. But I understood that it could be. (S4, from METU, I).

Another interviewee also said that she understood her weakness and at which points she had to develop herself. She said,

Kesinlikle bir katkı sağladığını düşünüyorum. Hani o yaptığımız yorumlar ile ilgili "a bu da böyle düşünüyormuş". Ne güzel hani ben orayı görememişim. O açıdan geliştirebilirim. Bir olaya daha farklı yönlerden bakabilirim. Bunu öğrendim.

Undoubtly, I thought that it made a contribution. Related to comments, someone thought in such way. What a pretty. I could not see this point, before. I can develop my self on this topic. I can see a case in different ways. I learned this. (S23, from AU, I).

In addition, owing to the existence of inservice teachers, preservice teachers confirmed their opinion related to practice. One participant said,

Öğretmenlerin fikirleri sayesinde konu ile ilgili kendi düşüncelerimi karşılaştırma imkanı buldum. Bu sayede uygulamada fikirlerimin yerini gördüm.

Owing to teachers' opinions, I had an opportunity to compare my thoughts with theirs. So, I understood the place of my thought in practice (S23, from AU, I).

Another interviewee who is the one of the active member of the preservice teachers criticized mutual discussions. According to her, persuasion problem to each other was the main reason for this. During a discussion, conflicting discussant can not persuade each other and thus they finished the discussion as is.

> Tartışmalar çok etkili olmuyor açıkçası. Yani biri görüş belirtiyor. Siz ona katılıyorsunuz veya katılmıyorsunuz. Çok ikna edici olmuyoruz sanırım birbirimize. Tabi bazı tartışma kesin şeyler var ama bazı konularda da ikna edemiyoruz. Mesela 2. sınıfta olan çocuk için "Bu problem nasıl çözülür?" diye bir soru vardı. Bende oraya kendi fikrimi yazmıştım nacizane. Daha sonra Cemil öğretmen bana bir mail attı ve "Doğudaki öğrencilere siz matematiğin ne olduğunu öğretemiyorsunuz ve niye böyle açıklıyorsunuz? Siz denklem kurdunuz. Başka hiç bir şey değil." diye yazdı. Onunla bu konuyu, o bana gönderdi, ben ona… Özel mail adresine göndererek baya tartıştık. Sonuç itibarıyla bir o kararda bulunamadık yani. Ben haklıyım. Sen haklısın olayı.
>
> Discussions were ineffective. Somebody stated an idea and then you agree or disagree to it. I think that we are not persuasive to each other. Of course, in some discussions there were some certain things but in some topic we could not be persuasive. For example, there had been a question "how can be solved this problem for second level children?". I sent my comment. Then, the teacher Cemil sent a reply. And he said "you can not teach what mathematics is to children living in the east part of the county and how could you solve this problem in this way?. You solved it by equation. It was nothing else". He sent me and then I sent him. then we sent private messages. Consequently we can not come a certain point. I am right or you are right. (S15, from COMU, I).

Apart from these participants, there was another member who did not continue to read messages coming from the discussion list. She said that she did not followed discussions but even she organized e-mails in a folder to read in the future and in the spring term she log in the PDC portal when she needed documents.

> Düzgün olarak okuyamadım yoğunluktan ama silmiyorum muhafaza ediyorum. Mutlaka bir gün gelip kullanacağım diye duruyorlar. Yani konuları yanında yazıyor sonuçta maillerin. Onları takip etmek istiyorum aslında ama çokta fazla okuyamadım.
>
> I could not read regularly but I didn't delete them, cover them. They remained since there will be a day when I need them. That is, the topics are written on them. I want to follow them but I did not read very much. (S9, from COMU, I).

4.5.8. Comparison with mandatory participation with the voluntary participation

All interviewees paid attention to the decreasing teacher candidate contribution in the voluntary participation term when they compared it with fall term. This result can be seen from the Table 4.11. In the fall term, there were 189 messages while in the spring term there were only 55 messages coming from preservice teachers although their amount increased three times.

Voluntary participation term was more effective

Four of the interviewees stated that voluntary participation term was more beneficial for them. First of all, they said that in this term coming activities and comments were more valuable. The ideas, obtained owing to real life experiences, were more important for them. Moreover, determined discussion topic was problematic discussion topics in the real life. Therefore, they preferred quality than quantity. One of them said,

> Ben bahar döneminin daha yararlı olduğunu düşünüyorum. Ilk dönemde video izliyorduk. Video izlemek gerçekten bir şeyler öğrenmek açısından güzeldi. Gözlemlemek açısından güzeldi. Ancak bu dönemde daha hoş çalışmaların portala geldiğini görüyorum. Geçen dönemde bunlar bu kadar fazla değildi.
>
> I think that the spring term was more beneficial. In the first term we watched videos. It was good to watch videos to learn or to observe something. However, in this term I see that better studies came to the portal. (S15, from COMU, I).

Another participant compared mandatory participation with voluntary participation,

> Sonbahar dönemi yine bir zorlama deneyim yaptırım olduğu için daha aktif katılmıştı herkes ama şimdi ihtiyaç ile başvurulan bir şey gibi oldu. Takip ediliyor. Mailler okunuyor.
>
> The participants were more active in the fall term since it requires mandatory participation but now people needing it were in the PDC. They are following and e-mails were read. (S14, from COMU, I).

Another participant took attention practical knowledge in the new environment.

> Özellikle öğretmenlerin yorumları çok hoşuma gitmeye başladı. Tecrübe açısından bizden daha üstteler. Bir şeyleri daha çok biliyorlar uygulama

konusunda. Mesela; çoklu zekanın tanımını bile biz, öğrendiğimiz gibi veriyoruz. Çünkü bize böyle öğretildi. Belki bunu sorgulama ihtiyacı bile hissetmedik ama hocamızın biri çok güzel bir yanıt verdi.

Especially, I like teachers' comments. They were better from us about experience. They know more about practice. For example, we presented the definition of the theory 'multiple intelligence' as we learned because it was thought us in such way. May be we did not conclude it. However, one of the teachers wrote a good reply. (S23, from AU, I)

Mandatory participation term was more effective

Apart from the participants who supported voluntary participation term, the others credited mandatory participation term more valuable. One of them felt pertain to the PDC in the fall term since she participated to the discussions only in this term. She said,

İlk dönem, kendimde katıldığım için daha aittim. Daha benim diye hissediyordum. Şimdi okumayınca koptum. Dışında kalıyorsunuz ister istemez. Keşke başından çok daha aktif bir şekilde takip edebilseydim.

In the first term, I appertain to it since I participated in. I feel that it is of mine. Now, I break off. You were out of circle even if you do not want. I wish I had followed in the beginning. (S9, from METU, I).

The other participant emphasized good productions of mandatory participation term.

İlk dönem, güz dönemi sonuç açısından iyiydi yani üretimimiz güzeldi hocam. Şu an fikir tartışmasındayız. O zaman hem fikir vardı, hem de bir uygulama vardı. Bir üretim vardı.

The first term, fall term, is better as a result, that is to say that our products were good. Now, we discussed on ideas. In the first term, there were both idea and implementation. There was a production. (S26, from AU, I)

4.5.9. The factors to increase preservice teachers' participation to discussion list discussions

Eight factors to increase preservice teachers' participation to discussion list discussions were determined. These factors special to voluntary participation term are follows,

- Defending own ideas,
- Gaining reputation,
- Sincerity in the environment,
- Questions and answers,
- Collectivism,
- Getting more responsibility,
- Self confidence and having wide ranging knowledge,
- Sociable personality,
- Readiness level for lifelong learning,
- Having diverse ideas,
- Citations,
- Transmission of prior knowledge,
- Desire to learn something,
- Altruism,
- Quality of discussion topics,
- Advantage of the Internet environments.

Defending own ideas

The preservice teachers generally defended their ideas across to the other members who have opposite ideas. One of the interviewees stated this reason,

> Ben bir şey yazıyorum sonuçta. Savunmalıyım veya yanlışım varsa öğrenmeliyim diye düşünüyorum. Düzeltme olabilmesi açısından.
>
> I wrote something as a result and I have to defend it or if I am wrong I have to learn to improve. (S15, from COMU, I).

This reason was also observed in discussion list discussions. There were five discussion topics which the members on opposite sides strictly defended their own opinions. One interesting case is important to show how a preservice teacher needs to explain more herself. This discussion occurred among a teacher, a preservice teacher and an academician. The teacher stated an idea and then the preservice teacher accepted his idea and wrote supporting things. Then, the academician wrote,

> S26 bu arada sana çok şaşırdım. Benim en iyi öğrencilerimden biri olarak bu kadar çabuk karşı fikre teslim olman bende birşeyleri eksik yaptığım izlenimi uyandırdı (A1, 20 May 2006 15:50).
>
> Meanwhile, S26, I was surprised you. That you, the best student of me, surrender an opposite idea quickly; left me an impression of my doing wrong something.

After the preservice teacher read this mail she was sad and she sent the following mail to the researcher,

> A1 hocam sanırım nette değil hocam. Yarın LES e gireceğim çok üzüldüm. Beni yanlış anladı ve aklım onda hala acaba siz ulaşabilir misiniz? Inanın yeterlli derecede açıklama yapmadığım için yanlış anlaşılmalara sebep oldum.
>
> Mrs Baran, I think that A1 does not connect to the internet, now. Tomorrow, I will take the exam "LES". I am very sad. He misunderstood me and this stick in my mind. I wonder whether or not you can reach him? Please believe me that I caused misunderstandings because I can not make sufficient explanations. (P6, 20 May 2006:00:36).

Similar to this case, there were some other discussions among the members. If members got an email which includes criticism to their ideas, they need to express more themselves by finding some evidences supporting their ideas. Furthermore, if the previous mail is too long, the members cited some paragraphs into their own mail and then wrote their messages for defending themselves.

Gaining reputation

Reputation means having a good name in a public. The participants followed a way of thanking for messages to be known from the community. For example, one of the participants told in her interview that she liked to read some messages. In this situation, they thanked the owner of the message.

> Teşekkür etmek. Katılıp katılmadığımı kısa da olsa belirtmek gerçekten çok hoş. Mesela Bandura'yı yazan arkadaşa bir mail attım. Daha sonra harflerle sayılarla ilgili bir anektod geldi. Onu da çok beğendim. Özellikle buna da tesekkur etmek istiyorum.
>
> Thank for, stating whether or not I agree is very nice. For example, I wrote an e-mail to the member having sent an e-mail about Bandura. Then, a forward mail came about letter and number. I also liked it. I want to thank especially this. (S15, from COMU, I).

In the e-mails, there were 30 thank messages. 10 of these messages were from preservice teachers and all members and preservice teachers thanked the same things. Eight of the members thanked the others after they made a request or asked a question. 12 members thanked the owner of messages for the lesson plans or activities. The other 10 members thanked some members since they replied their messages or questions. For example, one of the preservice teachers asked a question with thank to one of the academician,

> …Gerçekten çocuklar bizden ezbere bilgi mi istiyorlar? Ne kadar onların bulmalarını sağlamaya çalışsak da cocuklar bizden bazı şeyleri bekliyorlar. Ne yapmamız lazım? Teşekkürler.
>
> …Actually, do children want rote knowledge from us? Evenif we try to make them to discover, children expect something from us. What should we do? Thank you. (P6, 13 Apr 2006, 06:59:30).

Another preservice teacher thanked for an activity,

> Göndermiş olduğunuz ekteki örneği çok beğendim. Teşekkür ederim. Iyigünler.
>
> I liked very much the attachment you sent. Thank you. Have a good day. (P2, 19 May 2006, 21:21:56).

Questions and answers

Four interviewees said that teachers and preservice teachers were helpful to each other. Therefore, if one of them had asked any question, certainly there would have come back an answer to this question. So, asking for help and replying this question was a factor to increase the contribution of teachers.

> Biri birinden yardım isterse bu konuda gerçekten yardımseverler. Cevap geliyor yani işte. Sonuçta insanlar birbirlerine yardım etmeyi seviyorlar. Öğretmenler birbirlerine yardım ediyor kesinlikle.
>
> When someone calls upon another, they are very helpful. Replies come. Consequently, people like to help others. Teachers certainly help to others (S15, from COMU, I).

> Birisi bir şey sorduğunda veya bunla ilgili bilgisi olduğunda bunu belirtmek istediğinde mail sayısı artıyor. Mesela kongre ile ilgili mailler çoğalmıştı bir ara. Sorular çok önemli zaten. O çekiyor insanları.
>
> When someone asked a question or she wanted to state her idea related to this, mail count increased. For example, mails increased related to congress. Questions are very important. They attract attention of people. (S23, from AU, I).

In the discussion list discussions, there were 10 questions which were directed to members and three questions to specific people. There were two main reasons to ask question;

- requesting something,
- learning,
- Understanding what the others think about the topic.

One of the reasons of the questions was requesting something. One of the participants requested,

> Drama dokümanını hala kimse göndermedi. Gönderebilir misiniz? Gerçekten merak ettim. Yeni üye olunca kaçırmışım dosyayı?
>
> Nobody sent the drama activity. Could you please send it? I really wonder it. I could not get the file since I am a new member. (P3, 16 Mar 2006, 16:29).

One of the preservice teachers directed a question to one of the academicians to learn something.

> …Gerçekten çocuklar bizden ezbere bilgi mi istiyorlar? Ne kadar onların bulmalarını sağlamaya çalışsak da cocuklar bizden bazı şeyleri bekliyorlar. Ne yapmamız lazım? Teşekkürler.
>
> …Actually, do children want rote knowledge from us? Even if we try to make them to discover, children expect something from us. What should we do? Thank you. (P6, 13 Apr 2006 06:59:30).

Sincerity in the environment

Two participants underlined the importance of sincerity in online environments to share or discuss something. One of them said,

> Hani bu portalı bildiğim için paylaşıyorum ama hiç bilmediğim bir yer olsa, hani internette dolaşırken bulduğum bir yer olsa oradaki samimiyeti görmem gerekiyor. Bence paylaşacağın şeylere değer verileceğini bilmek önemli. Bir şeyleri paylaşırsınız ama onun değeri bilinmezse pek fazla da anlamı olmaz.
>
> I shared because I knew this portal but I need to see sincerity in the environment if I found there when I was searching on the Internet. In my opinion, it is important to see that the others will set a high value on them. You can share something but if its value was not understood there would be no meaning. (Seda Nur, from METU, I).

Collectivism

Collectivism is motivation with the ultimate goal of increasing the welfare of a group or collective (Batson, 1994, cited in Batson, Ahmad & Tsang, 2002). In this study, collectivism has been another factor increasing knowledge sharing. One of the participants said,

> Benim elimde bir sürü kaynak var. Neden atmayayım hocam? Emek harcadım yaptım. Sonuçta ödevin parayla satılması da çok kötü bir şey. Eğer ben öğretmen olacaksam bunu bütün insanlığın hizmetine sunmalıyım. Herkes yararlansın. Fark ettim de hocam, ben dramayı gönderdiğimde o kadar çok mail geldi ki. Öğretmenler dramayı da bilmiyor. Belki hani örnek alırlar.
>
> I have lots of source. Why I can send them to others? I tried to make. As a result, selling homework is not a good behavior. If I will be a teacher, I have to share it with all people so that everyone can benefit from it. I noticed that when I send drama activity, how much e-mail was sent to the discussion list. Teachers do not know drama. May be they can be an example for them. (S26, I, from AU).

Getting responsibility

One exceptional case had been a factor which increased the contribution of one the preservice teachers. Getting more responsibility pertaining to the PDC made this participant more active. In this part, this case will be presented in the following paragraphs.

S23 was a teacher candidate from AU. During the mandatory participation term, the researcher observed that she made more contribution than the other AU students and she had been a problem solver of the group related to technical or motivational problems. Therefore, the researcher thought that she would be a good moderator of the discussion list and the portal. So, the researcher sent an e-mail to learn what she would think about being a moderator. She was completely positive. Therefore, the researcher made S23 a moderator of the discussion list and portal at the end of the mandatory participation term. She mentioned her first impression about being a moderator,

> O gün çok moralim bozuktu. Çok heyecanlandım okuyunca. O gün keyfim yerine geldi diyebilirim. "vay be" falan oldu "ben neymişim?" Arkadaşlar söylüyordu. Sizde böyle bir şey isim olarak takınca baya bir şey oldu. Zaten bir şey olsa sınıfta da öyle direkt veriyorlar. "S23 sen yap. S23 sen yürüt" grup çalışmalarında da direkt başkanlık, lider yapıyorlardı. Sevindim yani.
>
> I was downcast. When I read I excited very much. I got timpsy. I said "wow!. My friends often say this. When you authorize me, it was very important. Whatever there was a task to make in the class the other also said me "could you please do it,

S23?" also chief of group studies is given to me. I was very happy. (S23, from AU, I).

She also told how she motivated to contribute to the environment,

Benim daha çok şeyler yapmam gerekiyor. Neler yapabilirim diye düşünüyorum. Sorumluluğumun daha çok arttığını düşünüyorum. Bu dönemin benim için gerçekten daha fazla yararlı olacağını düşünüyorum diğer döneme oranla.

I have to do more things. I think what I can do. I think that my responsibility increased. I believed that this term will be more beneficial rather than the other term. (S23, from AU, I).

Self confidence and having wide ranging knowledge

Three interviewees said that members, who were familiarized with the topics before, participated to discussions. Self confidence has an important place to contribute to the environment. It has been an important factor to promote the discussions. One of them said,

Bir şeyler bilmek ve kendine güvenmek çok önemli bu konuda diye düşünüyorum. Eğer ki ben bir şeyler biliyorsam yorum yapabilirim ve ya ne bileyim neticede kendime güveniyorsam fikirlerimi açıkça söyleyebilirim.

In my opinion, knowing something and self confidence is very important. If I know something I can make comments or if I am a self confident person, I can express my ideas explicitly. (S26, from AU, I).

This reason was observed in the discussion list discussions. The complexity of emails was explored in title 3.5.3. According to this result academicians sent longer mails than preservice teachers and inservice teachers. This is because of their being sophisticated and self confident. Moreover, in the beginning of the last discussion topic, one of the teachers stated how being knowledgeable on a topic affected her contribution to the discussion,

Çoklu zeka konusunda bilgim olmadığı için tartışmalara katılamadım. Ama farklı ve yeni bilgiler öğrenmek güzeldi. Bu ayın konusu hoş ve herkesin çok rahatlıkla katılabileceği bir konu.

I could not participate to the discussions since I did not have any idea about multiple intelligence. However, learning different and new knowledge was good. The topic of this month is lovely and everyone can participate comfortably. (T12, 04 Jun 2006 14:27:32)

Sociable Personality

Four interviewees took attention the personality of the people in the PDC. To them, some of people are more sociable than others. One of the interviewees said,

> Belki vakti olduğu için ama başka da vakti olup buna vakit ayırmayanlar var. Daha çok bazı insanlar bu tür şeylere daha ilgili oluyor. Bazıları daha ilgisiz oluyor sanırım.
>
> May be, they have time but some people having time did not have time for the PDC. Some people interested in such things while some do not. (Seda Nur, from METU, I).

One of them, who was an active member, described her personality in the PDC,

> Bu kişilikle alakalı bir şey diye düşünüyorum. Sonuç itibarıyla arkadaşlar bu yüzden benimle dalga geçiyorlar. Ben hiç insanları ayırmadan her insanla görüşen bir kişiyim. Benim için karşıdaki insanın ilk başta kim olduğu önemli değil. Daha sonra nasıl davrandıklarına göre… Herkesin benim için artı bir potansiyeli var. olumsuzluk olduktan sonra görüşmeyi kesiyorum.
>
> I thought that this is related to personality. Consequently, my friends banter about me since I am a person who meets every people without diversing them. In the beginning, for me it was not important who they are. Then, how do they behave? Everyone has a plus for me. After some negative things happen, I don't interest with them (S15, from COMU, I).

Readiness level for life long learning

This factor was one of the motivators of mandatory term since some preservice teachers having this idea participated more willingly and voluntarily to discussions and their participation amount was higher than the others. In addition, whether or not a preservice teacher accepted life long learning as a life view was one of the motivators of the voluntary participation term. This idea motivated them to participate to discussion list discussions in this new term in spite of lack of mandating. During the interviews they underlined this idea. One of them said,

> Hocam bu yeni ortamda tartışmalara hala neden katılyorum? Çünkü herşeyden once ömür boyunca yararlanacağım bir kaynak olarak görüyorum. Bu benim mesleğim ve ben kendimi geliştirmeliyim.
>
> Mrs. Baran, why am I am still participating to discussions in this new environments. Because, the PDC is a source which I can benefit from. Teaching is my profession and I had to develop myself. (S26, from AU, I)

Having diverse ideas or information

Two interviewees said that they wrote a unique message or replied another message when they had a diverse idea. One of them said,

> Hiçbir fikrimin olmadığı maillere cevap yazmıyorum açıkçası. Vaktim varsa ve bu konuda düşüncem, benimde katılabileceğim farklı bir şeyler varsa yazıyorum.
>
> I do not write any answer to the mails about which I do not any idea. If I had time and I had an idea, different things which I can participate, I wrote. (S15, from COMU, I).

Transmission of prior knowledge

Similar to mandatory term, in voluntary term, preservice teachers often transmitted their prior knowledge to the environment. Therefore, they could make richer comments. For example, one of them sent following message while they are discussing on drama and mathematics.

> …. Öğrencileri fiziksel olarak harekete geçirirken, zihinsel olarak da düşünmelerini sağlayan ve aslında kendileri yaşantılar oluştururken öğrendikleri bir öğretim tekniği. Geçen sene ilk dönem biz de okulda kurayla bu yöntemi almış, grupça araştırmış ve sunmuştuk. Makalede giriş, gelişme ve sonuçlarıyla verilen aktivite sınıfta uyguladığımız bir aktiviteydi biz sınıfça çok eğlendik ve bunu sevgili Tülay Üstündağ hocamızın kitabından almıştık. Drama çok etkili bir yöntem. Makaleyi bize kavuşturanlar için teşekkür ederim:)
>
> This is teaching method which let children think mentally while activate them physically and indeed they learn while they live. Last year, in the first term, we learn this method and search anf presented as a group. This activity which presented in the article with introduction, development and results is the first activity which we applied in the classroom. We had a good time. We got this activity from dear Dr. Tülay Üstündağ's book. Drama is very effective method. Thank to whom sent the article us ☺ (Işıl, from METU, 06 March, 2006 18:10)

Citations from original comments

In the voluntary participation term, the participants citated others' messages more than being in mandatory term. Discussions generally focused on one's interesting idea or scientic material which was sent from the moderator. Differently from mandatory term, in this term there were not completely copied messages from other members' ideas only to fulfill the responsibility. The aim of making citiation was really desire to discuss on it. For example,

one of the experienced teachers' experience on misconception of fraction and a preservice teacher reply to this message:

> Genç arkadaşlar icin bende sınıfta karşılaştığım bir tespitimi yazmak istiyorum. Kesirler konusuyla ilgili ilk örnekleri çözerken öğrencilere 15/3 - 18/3 sorusunu sorduğum zaman öğrencilerin çoğu bu soruyu çözemeyebiliyor. 5-6 şeklinde düşünseler aslında daha çabuk çözecekler ancak bu yolu takip etmediklerini gözlemliyorum selamlar.
>
> For novices, let me write one of my experiences. About fractions, most of my students could not solve following question: 15/3-18/3=?. Indeed, they should think 5-6. However, I observed that they could not achieve this. (T3, 12 April, 2006 18:10).

> Kesirlerde sadeleştirme durumu işlemlerimizi daha rahat yapmamızı sağlıyor; ancak sedeleştirmede 15/3' i 5 olarak, 18/3' i de 6 olarak görmek cok zaman istiyor gibi geliyor bana. Kendi deneyimlerimden hatırlıyorum, sadeleştirme işlemini görme konusunda ben de çok zorlanmıştım. Bu türdeki soru sayısı coğaltılırsa öğrenciler sadeleştirmeyi daha rahat görebileceklerdir. Benim de 4. sınıflara uygulamış olduğum calışma yaprağındaki sorulardan biri şu şekildeydi. "Küçük şişede 2/5 litre, büyük şişede ise 3/5 litre su bulunmaktadır. Suların tamamını tek bir şişede toplamak istersek kaç litrelik bir şişeye ihtiyacimiz olur?" Ögrencilerin çoğu bu soruyu ondalık kesir gibi düşünüp şu şekilde yanıtladı :
> 2/5
> 3/5
> 6.0 (alt alta toplayıp, ondalık kesir gıbı düşünüp işlem yaptılar.)
>
> Simplicatation of fraction let us make calculation easily. However. in my opinion, during simplification, visualization of 15/3= 5 and 18/3=6 takes time. I remember from my own experiences that I also had difficulties during simplification. If the number of this type of questions are increased, children can see simplification more easily. One of the questions from my worksheet for 4th year children: "There are 2/5 litre water in a small bottle and 3/5 litre water in big bottle. if we want to combine these amounts in a bigger bottle what should be the capacity of this new bottle?" Most of the children think this calculation as decimal fraction
> 2/5
> 3/5
> 6.0 (they calculated by bringing one under the other)
> (S23, from METU, 12 April, 2006 18:10).

Desire to learn something

According to four participants, another reason which forced to read and contribute to discussions was strong concern and the idea of what others know different from them.

> İlgimi çekiyor ve daha çok şey öğrenebilirim ben bu sayede diye yazıyorum. Belki çok farklı bir şey vardır kaçırmayayım diyordum**.**

> It took attention of me and I wrote because I can learn more things. May be there were very different things and I do not want to skip them. (S23, from AU, I).

Another participant explained what kind of things she wants to learn in this environment,

> Sıradan bir şeyse ilgimi çekmez. Öğretmekte zorlandığımız konular. Her öğrencinin takıldığı yerler hepsinin aynı oluyor. Hani o tür şey olduğu zaman. Çünkü ileride bizim de başımıza gelecek. Ne yapabilirim? Nasıl olabilir? Onun için o tür konular daha çok ilgimi çekiyor.
>
> If it is ordinary I am not interested. The topics which were difficult to teach. The difficulties which every student lives are the same. Something likes that. Because we will live in the future. What can I do, how can it be? I interest in this kind of topics. (Seda Nur, from METU, I).

Altruism

Altruism's ultimate goal is "to increase the welfare of one or more individuals other than oneself" (Batson, Ahmad & Tsang, 2002, p.436). One of the preservice teachers emphasized that empathy feeling caused others' sharing knowledge with them,

> Matematik ile ilgili bizlere bir şeyleri daha çok vermek istediklerini düşünüyorum. "Arkadaşlar biz böyle yaptık siz de bunu bilin" yani paylaşmak için bizimle. O şekilde. Tamamen bizi de düşündüklerinden
>
> I think that they want to give more something related to mathematics. "Friends, we made this such. You should know this". That is they want to share with. So as to care of us exactly. (S23, I, from AU).

Quality of discussion topics

Instead of using videos in mandatory term, in this new environment the researcher used general discussion topics and scientific publication to support community members to participate in discussions. The participants emphasized the importance of the quality of video cases in mandatory term. Similarly, they also emphasized the quality of discussion topics and materials which were sent to the discussion list to increase participation of preservice teachers. One participant said,

> Simdi bu dönem bazı konular benim için çok çekiciydi. Örneğin drama konusu ve listeye gönderdiğiniz ders planları. Bende bu dönem drama kursuna gidiyorum ve bu sebeple bu konu üzerindeki tartışmalara katıldım

> Now, some of discussion topics is very attractive for me. For example, drama topic and lesson plans. I am also participating in a drama course in this term and so I participated discussions in this term (S14, from COMU, I).

Advantage of the Internet environments

Similar to mandatory term, in this new term, the participants emphasized the anonymity attribute of the Internet environments. One of them said,

> Okul uygulamasına gittiğimiz zaman öğretmenlere bazen sorular sormaktan çekiniyorum. Yanlış anlamalarından korkuyorum. Ama internet ortamının güzelliği burda. Hani kimse sizi görmüyor. Istediğiniz gibi rahatça konuşabiliyorsunuz.
>
> When I went to school practice, I sometimes hesitated to ask questions to teachers. I fear of their misunderstanding me. However, the advantage of internet environments is that nobody see you and you can speak comfortably. (S14, from COMU, I).

4.5.10. The factors to decrease preservice teachers' participation to discussion list discussions

Ten factors which decreased amount of contribution has been determined. These are,

- Feeling availability of the others (fear of criticized by others, not wanting to seem clueless),
- Academic information practice duality,
- Lack of time,
- The idea "max benefit minimum effort",
- Hesitate to misdirection,
- Not repeating the same things,
- Unread prior comments,
- Familiarization with ICT,
- Internet access and computer availability.

Feeling availability of others

Feeling availability of others in the environment has been one of the factors which hinder to send comments to public environment. One of the participants said that she sent

private message after one point of the discussion because of lack of self confidence. Private messages decreased intensity of the discussions. She mentioned how this process developed,

> **S15:** Bir de ben her şeyi ilk mesela bir şey yazacağım zaman yazıyorum. Ya da biri bir şey yazdığı zaman yazıyorum. Ondan sonra direkt kişilerin mail adreslerine atmayı uygun görüyorum. Biz onu tartışırken niye ortak olsun ki diye düşünüyorum. Öyle de görüştüğüm çok oluyor.
> **Araştırmacı:** Peki neden özelde tartışmayı tercih ettin?
> **S15:** Bu benim kendime güvenmediğimden olabilir.

> **S15:** In addition, I wrote my comments if it's a new thing or I replied another's e-mail. Then, I thought that it is more appropriate to write private message. I thought "why will our discussions be public?" I often communicated in such way.
> **The researcher:** Why did you prefer to write private messages?
> **S15:** It could be because of lack of self confidence. (S15, from COMU, I).

Another participant said that some of members did not want to *seem clueless to other members*. In addition, she said that members fear of being criticized by others. Therefore, they did not share their ideas or material with the others.

> Kendilerinin zarar görmesini ya da kendilerini mahçup etmek istemiyorlar. Neden çünkü benim şöyle şöyle bir öğrencim var. Ne kadar anlatsam da anlamıyor. Böyle bir şey diyemez zaten. Başka sormak istediği bir çok şey var ama soramıyor olabilir. "Demek ki ben yeterli değilim" ya da dışarıdakiler, mailleşen grup böyle düşünmesin diye. Şimdi bunların hepsinin bir sürü hikayesi var. Ama paylaşmıyorlar**.** Başkalarının eleştirmesinden de çok çekiniyorlar. Söylersem eleştirirler. En iyisi susayım.
>
> They do not want to come to harm or they do not want to be ashamed. Why? Because they can not say that I have a student and whatever I try she/he does not understand. They have other questions but they can not ask. They think that they are not perfect or they do not prefer that the other members think so. Indeed, they have lots of story but they did not share it. They very hesitate from others' criticisms. So, they preferred to keep quiet. (S26, from AU, I).

Academic information - practice duality

Another factor influencing preservice teachers' participation to discussions was the academic information and practice duality. One of the interviewee supported that teachers in the portal hesitated to discuss with academicians because they thought that academicians spoke about ideal learning environments. This hesitation of teachers affected preservice teachers' comments directly.

Okuldaki öğretmenlikle üniversitedeki eğitim arasında bir şeylerin hep değiştiği söyleniyor. Sonuçta burası üniversite eşliğinde olan bir portal ve bu konuda sanırım öğretmenler açık olmak istemiyorlar. İşte Cemil bey öyle dedi. "Siz inşallah üniversitede öğretim görevlisi değilsiniz. Çünkü Hocalar bize dört dörtlük öğretiyorlar. Gelip buraları görmüyorlar" diyor. Böyle olunca ben de yazmaya çekiniyorum.

There are something different between teaching in schools and university education. As a result, this environment is a portal supported by a university. Therefore, I think that teachers do not want to be explicit. The teacher Cemil said "I hope you are not an academician because they teach us hunky dory. They don't see here by coming." So, I hesitated to write (S15, from COMU, I)

Not wanting to enter a fight

Two interviewees stated that they did not want to dispute with others. They did not participate to some discussions because they believed that it would turn into a fight or there is not an end. One of them said,

Hocam çok fazla tartışmalara girmek istemiyorum. Bir kere tartışmanın sonunda bir yere varamıyorsanız artık yazmak için bir sebepte geriye kalmıyor. Karşınızdakinin sizi nekadar anladığı meçhul"

I do not want to enter discussions, very much. If you do not come to a result point at the end of the discussion, it is unnecessary to write. How much opposite side understands your opinions is a vague (S15, from COMU, I).

Another said,

Ya.. bazen kavgaya dönebiliyor. Izlemeyi tercih ediyorum ☺

Sometimes it turns into a fight. I preferr to follow ☺ (S4, from METU I)

Lack of time

Some participants stated that passive members could not find any time to participate to discussions in this new environment. They were busier in this term than mandatory term since limited time remained for teacher entrance exam and their graduation from the university. One of them said,

Hocam geçen dönemde yoğunduk ama bu dönem daha yoğunuz. KPSS 'ye az kaldı. Bide universiteden mezuniyet telaşı var. bence çoğunluk bu yüzden katılmıyordur.

Mrs, Baran, we were busy in the last term but in this new term we were busier. There is limited time for teacher enterance exam. In addition, we have to gradute

from the university. In my opinion, the reason of their being passive members is this (S9, from METU, I).

The idea "Max benefit minimum effort"

This factor was determined owing to the researchers' observations. In the voluntary participation term, the participants, either preservice teachers or teachers, do not want to try to spent extra effort. They preferred easiest one if they had two ways. For example, instead of preparing a lesson plan to share with others, they waited others' sending. Or else, as soon as the researcher announced that she submitted new activities to the PDC portal, they signed in the portal. These observation results showed that they wanted to benefit from the environment with minimum effort.

Hesitate to misdirection

Two of the interviewees stated that they do not want to direct others wrongly. To them, before they send a message, they should experience it. One of them said,

> O noktada kesirler konusunda ben ne kadar yeterliyim. Eğer ben çok yeterli olduğumu düşünmüyorsam, yanlış yönlendirme yapmaktan çekinirim açıkçası. Hani, mail atmaktan çekinmem de, hani yazdığım şeyin doğruluğundan ya da yanlışlığından çok emin değilsem, işlerliğinden ya da nasıl işe yarayacağından çok emin değilsem, o noktada çekinirim. Ama eğer başıma gelen bir şey ise, ben deneyim etmişsem ve olumlu sonuç vermiş ise onu yazarım.
>
> How much I am qualified on fractions. If I don't believe in my competency I hesitate to give wrong directions. I do not hesitate to send e-mail but rather I hesitate if I am not sure of accuracy of information or how it works. However, if I experience it and if it works positively I write it. (S9, from METU, I).

Another participant mentioned how her poor knowledge about mathematics education affected her writings to the discussion list,

> Yorumumu yazıyorum ama hep naçizane olduğunu söylüyorum. Kendimi bilgili hissetmiyorum bu konuda, özellikle matematik eğitimi konusunda. Matematik öğretimi olarak okulda bir şey öğrenmediğimi düşünüyorum sadece deneyimlerimle ve orada burada okuduğum makale, yazı onlarla takip ediyorum. Yoksa bir şey öğrenmediğim için cevap yazarken böyle çok çekine çekine yazıyorum.
>
> I wrote my comments humbly. I do not feel sophisticated about this topic, especially mathematics education. I thought that I did not learn anything in the university. I learned something only by experience and reading article in the PDC.

I hesitate to write because I did not learn anything from my undergraduate years. (S15, from METU, I).

Not repeating the same things

The last factor which influences contribution of the participants was "not repeating the same things". One of the interviewee said that she preferred not to send any comment if another member has written about this topic.

Yok. Her tartışmaya katılmıyorum. Ama mesela benim söyleyeceğimi benden önce birisi söylemişse ben onu söylemek ihtiyacı hissetmiyorum.

No, I do not participate in every discussion. For example, if someone said what I would say, I do not say the same thing. (S23, from AU, I).

Unread comments

In this term, most of the participants preferred to be lurker in the system. In addition, some of lurkers did not read all messages. One of them said,

Düzgün olarak okuyamadım yoğunluktan ama silmiyorum muhafaza ediyorum. Mutlaka bir gün gelip kullanacağım diye duruyorlar. Yani konuları yanında yazıyor sonuçta maillerin. Onları takip etmek istiyorum aslında ama çokta fazla okuyamadım.

I could not read regularly but I didn't delete them, cover them. They remained since there will be a day when I need them. That is, the topics are written on them. I want to follow them but I did not read very much. (S9, from COMU, I).

Low priority in their life

Similar to mandatory term, one of the factors decreasing their participation to the discussion is the PDC' low priority in preservice teachers' life. One interviewee said,

Herkesin kendine göre işleri var. Buna vakit ayırmak istemiyorlar. Mesela bu görüşmeye katılması için arkadaşlardan birini çağırdım ama gelmek istemedi halk oyunları kursuna gidiyordu. O daha önemli onun için. Sosyal etkinlikler olmasa bile bu ortamda tartışmalara katılmak onlar için elzem bir şey değil herhalde diye düşünüyorum.

Everyone have some occupations. They do not want spent extra time for this environment. For example, I invited one of my friends to participate this interview but she did not want to come with me since she preferred to attend folklore course.

This is more important for her. In my opinion, participating discussions in the PDC is not a necessity for her. (S23, from AU, I).

Familiarization with ICT

The participants' familiarization with Information and Communication Technologies (ICT) has been another factor which affected participation to discussion list discussions. One of them said that they have some anxieties with computers and the other said that there is a division between them and computers. She said,

Biz ellerimizde var olduğu halde yazmıyoruz. İnternet daha uzak bir şey galiba bize. Çok iyi bilmiyoruz sanırım. Ben şimdi bir şey göndermek için onu bilgisayara aktaracağız. Artı bir zaman diye düşünüyorum bunu. Aktardıktan sonra nasıl göndereceğim? Bunlar soru işaretleri.

We didn't write although we had [teaching activities to share]. The Internet is far from us. I think that we do not know it very well. To be able to send something you have to transfer it to digital environment. It requires additional time. After transferring how can I send it? All of them are questions. (S15, from METU, I).

Internet access or computer availability

Three of the interviewee stated that teachers who do not contribute to discussions might not access to the Internet to read the e-mails. That is to say that Internet access problem affected their participation to the discussions. One of these participants also said that she did not have a computer to access to the Internet whenever she wanted. One of them told,

Bulunduğu yerde internet olmayabilir. Maillere her hafta sonu bakıyordur. Bakmıştır, belki zamanı geçmiştir cevap yazmak için.

There may not an Internet access in their living area. They may check them at weekends. When they control the e-mails may be too old to reply. (S23, from AU, I)

4.5.11. Summary

This last part summarizes what happened in voluntary participation term. First of all membership history, message history, complexity of messages, e-mail amount according to the parts of a day were presented. Second, how preservice teachers accepted themselves in this new environment, their evaluation of the PDC and comparison spring term with fall term was discussed. Third, the reasons which affected the quantity of the e-mails were presented. (Table 4.21).

Table 4.21

Summary of the voluntary participation term

Period
Voluntary participation term continued from January, 1 to June, 30, 2006.
Membership
• There were 213 members in voluntary participation term and this number is five times more than being in the fall term. • The number of the inservice teachers passed beyond preservice teachers in April. • Inservice teacher were more eager to participate in online communities than preservice teachers.
Message traffic
• The members sent totally 219 messages to the discussion list. • In the beginning, the messages amount was low while in the following months it increased and in May it was the top. • In the beginning preservice teachers were more active but then the contribution of the inservice teachers increased • Only 19% of total members sent messages to the discussion list. Only four of the preservice teachers in the fall term continued to participate to the discussions in spring term. • Preservice teacher sent 26.9% of all messages.
Complexity of the messages
• The complexity of the messages was the top in May. • Preservice teachers sent more complex messages in April and May. • Academicians sent the most complex messages.
E-mail counts according to the parts of a day
• Most of the e-mails (32.2%) which were sent by preservice teachers were posted in the evenings. • Most of the all members (%35.6) sent messages on day afternoon.

Table 4.21 continued

Identity of the participants

- The preservice teacher accepted themselves in this environment as teacher candidates since
    - They felt the existancy of more experienced teachers in the environment.
    - They felt not to be complete in practice.
    - They professed a great esteem for more experienced teachers.

Evaluation of the PDC

- The preservice teachers said that they continued to follow the discussion because the new environment made also some contributions to them. their reasons are,
    - learning different things,
    - being keep up to date,
    - obtaining different opinions and ideas,
    - getting new perspectives,
    - belief modification,
    - learning the place of the theories in the practice
    - Confirming their ideas related to field practice owing to more experienced teachers.

Comparison with mandatory participation with voluntary participation

- Preservice teachers' participation to discussions and sharing in the discussion list decreased.
    - In the fall term there were 189 messages while in the spring term there were only 55 messages coming from teacher candidates although their count increased three times.
- Most of the participants believed that voluntary participation term is more effective. Their reasons are,
    - Activities and comments which were sent to the discussion list were more valuable.
    - Discussion topics were more attractive.
    - Fall term was a mandatory term. Participating with a need is more attractive.
    - They could obtain field practice.
- A few of them believed that mandatory participation term is more effective. Their reasons are
    - Watching videos is beneficial to learn something
    - Discussing and then producing lesson plans were more beneficial.
- Mandating forced preservice teachers to follow coming e-mails to discussion list and prepare lesson plans. In addition, active participation by mandating has been a factor which helps preservice teachers to feel "belong to the community".

The reason forcing to contribute to the environment

- Defending own ideas
    - The members defended their ideas against other people
- Gaining reputation
    - The members thanked to the other members' messages in following situations,
        - When a member sent attractive lesson plan, activity or teaching materials
    - After asking a question or requesting something to others they thanked before they replied their questions
- Questions and answers
- Teachers and preservice teachers were helpful to each other. Therefore, if one of them had asked any question, certainly there would have come back an answer to this question.
- Sincerity in the environment
    - The members said that they shared their ideas and products in case there was sincerity in the environment.
- Collectivism
    - Some preservice teachers wanting to be beneficial for other people shared their knowledge with them.
- Getting responsibility
    - When the members got more responsibility related to the PDC, their contributions increased.
- Self confidence and having an idea on discussion topic
    - The preservice teachers who have an idea about the discussion topic participated to the discussions.
    - In addition to having idea about the topic, self confidence has another important place to state ideas.
- Readiness level for life long learning
    - Whether or not a preservice teacher accepted life long learning as a life view was one of the motivators of the voluntary participation term. This idea motivated them to participate to discussion list discussions in this new term in spite of lack of mandating.
- Having a diverse idea or information
    - The members wrote a unique message or replied another messages when they had a diverse idea.
- Transmission of prior knowledge
    - Similar to mandatory term, in voluntary term, preservice teachers often transmitted their prior knowledge to the environment. Therefore, they could make richer comments.
- Citations

- Discussions generally focused on one's interesting idea or scientific materials which were sent from the moderator. The aim of making citation was really desire to discuss on it.

- Desire to learn something
  - The members participated to the discussion since they believed that they could benefit from the others
  - Preservice teachers especially want to learn the topics which were difficult to teach.
- Altruism
  - Some of them emphasized that empathy feeling caused others' sharing knowledge with them.
- Quality of discussion topics
  - They emphasized the quality of discussion topics and materials which were sent to the discussion list to increase participation of preservice teachers.
- Advantage of the Internet environments
  - The participants emphasized the anonymity attribute of Internet environments.

The reasons decreasing contribution of the members

- Feeling availability of others was reason of sending private messages. Not wanting to seem clueless, fear of criticized by others were also decreased to send public messages.
- Academic information practice duality
  - They hesitated to contribute the PDC since some of them did not want to dispute with the academicians or teachers.
- Not wanting to enter a fight
  - They did not participate to some discussions because they believed that it would turn into a fight or there is not an end.
- Lack of time
  - They want to graduate and thus they focused on their undergraduate courses since they were fourth year students
- The idea "max benefit minimum effort"
  - The participants wanted to benefit from the environment with minimum effort.
- Hesitate to misdirection
  - The participants did not want to share wrong knowledge.
- Not repeating the same things
  - The participants did not wan to repeat the same things with other participants. Therefore they preferred to keep quiet.
- Unread comments
  - Most of the participants preferred to be lurker in the system. In addition, some of lurkers did not read all messages

- Low priority in their life
    - Some participants are more interested in other occuppations
- Internet access or computer availability
    - The members did not access to the Internet or they did not have computers whenever they want
- Unfamiliarization with ICT
    - The preservice teachers have some anxieties with computers
    - Their low technology skills impeded to share hardcopy materials with other members

CHAPTER 5

DISCUSSION and CONCLUSION

Case study is a widely used research type in instructional technology research studies since it provides a meaningful knowledge base about the mechanism of a particular system. However, since this type of research studies are problem centered and small scale they are evaluated in their own context and can be compared with similar settings. The activity theory framework provides a useful analytical lens to understand the socio-technical structures of a particular environment since it allows to see a learner both in an individual group and in a large community (Engeström, 1999; Barab, Barnett & Squire, 2002; Barab, Evans & Baek, 2003; Schlager & Fusco, 2004; Barab, Schatz & Scheckler, 2004). This chapter is going to evaluate the findings that were reported in the previous chapter. Instead of developing researcher's own evaluation framework, a widely used and powerful evaluation approach, activity theory, will be used to discuss the findings.

5.1. Modeling of mandatory and voluntary participation terms

In order to understand how preservice teachers obtain field practice in two environments called as "online communities of practice", eight components of Engeström's triangle model were used to combine design process with the results of the study in a theoretical model (Figure 5.1). The researchers' simple definition of each component according to two environments is as follows:

Two activity systems

There are two activity systems of the study. The first one requires subjects' participation by the researcher's mandating (mandatory participation term) while the second

system lives with its members' voluntary participation (voluntary participation term). The activity in these two systems is preservice training and so granting professional qualification.

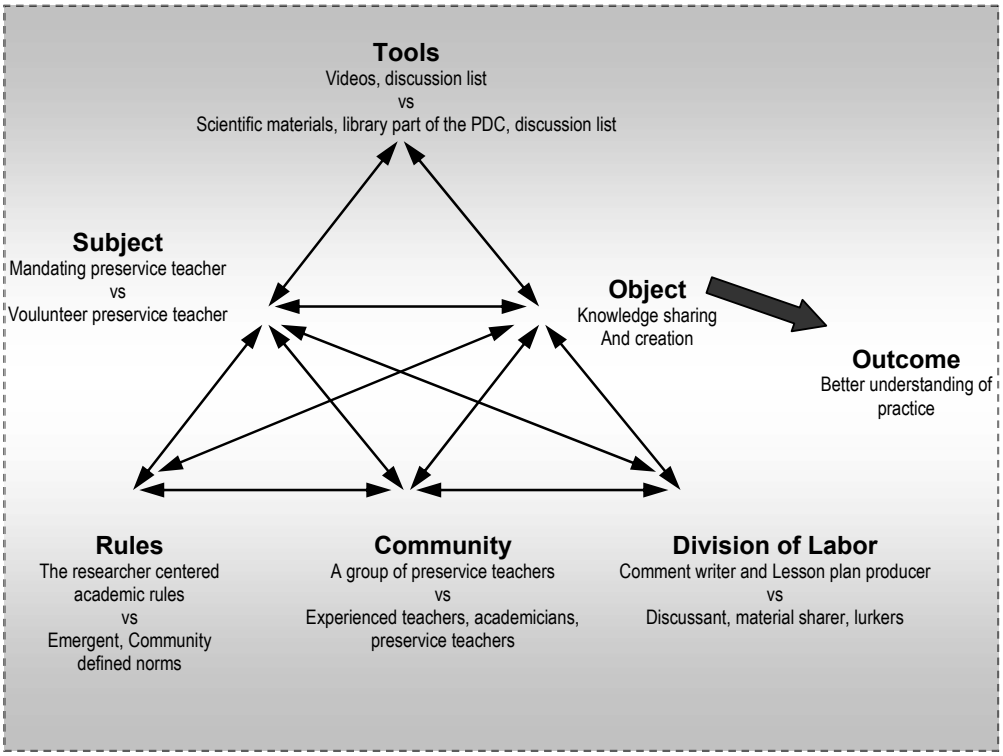


Figure 5.1 Definition of mandatory and voluntary participation terms according to activity theory framework.

Subjects

In the first activity system, the subjects are preservice teachers who need to develop professionally to be an experienced teacher. In the second activity system, the subjects are volunteer preservice teachers who want to develop professionally and believe the importance of this socio cultural environment to benefit from other colleagues.

Object

In two activity systems, the object is knowledge creation and sharing in mathematics teaching practice. In order to explain how knowledge is shared and created in both activity systems, the researcher used Nonaka's (1994) model "modes of knowledge creation" which views knowledge sharing as a spiral process of interactions between explicit and tacit knowledge. The model's main components are Socialization (tacit to tacit), Externalization (tacit to explicit), Internalization (explicit to tacit) and Combination (explicit to explicit) (p. 19). How the object was accomplished in two systems will be discussed with its connection to other components of the activity system in the subactivity systems part.

Tools

Vygotsky determined "tools" as the third element of a psychological activity between subject and object although radical behaviorists supported that there was a direct link between object (stimulus) and subject (respondent) (Barab, Evans & Baek, 2003; Driscoll, 2000). In this study, there are two types of tools which were used to accomplish the object in two activity systems; 1) material and 2) sign. Material is concerete instrument which is developed and then used by the researcher to be able to mediate the relationship between preservice teachers and knowledge sharing. Sign is unexpected abstract mediator in two activity systems that come out owing to the subject's observation. Two activity systems required using different tools in preservice teacher education. With the starting of voluntary participation term, the tools were changed according to coming proposals in the mandatory participation term. In the first activity system, digital videos and the discussion list are materials which support the subject to reach the objective. Video teachers' or students' mimics in videos and emoticons which mean facial expressions in text message to indicate preservice teachers' attitude toward each other are emerging signs in this activity system. In the second activity system, tools are a bit different from mandatory term. Using real classroom videos to support field practice was omitted. Instead, materials of second activity system were scientific publications (articles, research results, thesis, etc), the discussion list and Library part of the PDC which were produced in mandatory term. Sign in the second system was emoticons in messages.

Rules

Two activity systems had different rules. Design decisions which were detailed in the method section of the thesis were the rules of the first activity system. Some of them are posting minimum 3 messages in each discussion period, stable discussion duration (3 weeks for the first discussion period and 2 week for other periods) and determined responsibilities of each university in different discussion periods. However, in the second activity system, rules were mainly determined by the community. They are emergent and flexible and improved in time. At one time, a rule was tentative and individualistic while in the next time, the rule was more robust and diffused to all members of the community. For example, in this study, in the beginning of the voluntary participation term, a preservice teacher strictly waited for the direction of the researcher to start to discuss on the topics. With the participation of newcomers, members as a community gradually changed their behaviors. They were also active members and directors of their own topics. Another example is that at the beginning of the term a few members cited others' words in their own messages to be able to comment on them and to discuss more detailed. They also replied the e-mails which

they want to talk about to the discussion list to make other members to remember prior speaking. In the following months, citations and replying have been a community based rule. In addition, in this term, there were some flexible rules which the researcher determined. Contrary to the first activity system's rules, the researcher felt that she must have been more flexible in this term. Therefore, the duration of each period has been extended. She allowed community members to pass discussions beyond monthly discussion duration and supported new discussion topics which were started by the members.

Community

The community of the first activity system was 28 preservice teachers who were participated to the PDC environment as a part of undergraduate course. They were from different universities and departments, and so they had different backgrounds. However, in the second activity system, the community was bigger than being in the first activity system. Community members of the first activity system have been a part of the second activity system. These preservice teachers were actively involved in a community which composes from teachers, academicians and other preservice teachers in the same platform. The community was always open to newcomers. Therefore, in this system, community has a more dynamic nature.

Division of Labor

The last component of two activity systems is "division of labor". Engeström (1999) defined division of labor "compartmentalization based on disciplines, nationalities, languages, schools" (p.31). It means specialization of roles and task which increase quality of outcome. In the first activity system, every university sutdents had different responsibilities. In each period, two of the universities commented on onscreen teachers' class while the other university produced an improved lesson plan based on discussions. Therefore, there were two main division of labor: comment writer and lesson plan producer. However, in the second activity system, division of labor was an emergent attempt. There were discussants, material sharers, and lurkers in the system.

Outcome

The main outcome of two activity systems is "better understanding of field practice" in mathematics teaching. In this vein, how the activity systems affected preservice teachers' professional knowledge was investigated from the perspectives of the participants. The results revealed that both activity systems contributed preservice teachers' professional knowledge with different outcomes. In the literature, there are lots of supportive evidence

that online discussions promoted preservice teachers' critical reflection more than writing about a case without benefit from discussion or in class discussions (Hawkes & Romiszowski 2001; Pennington & Graham, 2002; Killian & Willhite, 2003; Levin, He & Robbins, 2006; Barnet, 2006). In addition, this study revealed that the main advantage of two activity systems was practice based construction, which face to face traditional environments do not have. Presentation of theoretical knowledge to teachers in professional development courses is completely criticized by teachers in the pilot study (Baran & Cagiltay, 2006). The uppermost outcome of the study "better understanding of field practice" is a result of lower level outcomes. Details of these benefits are as follows,

In the first activity system, sub-outcomes are,

- being knowable about the practice,
- having different perspectives and ideas,
- real life case;
    - beholding novel teachers' experiences,
    - not repeating faults in videos,
    - visiting various teachers' classroom, and
    - getting knowledge about new curriculum.

In the second activity system, there are also outcomes similar to and different from the first activity system. They are presented below. First two benefits are the similar to the benefit of the first activity system. However, outcomes related with real life case are absent in this system.

- learning the place of the theories in the practice,
- having different opinions and ideas,
- learning different topics,
- keep up to date,
- belief modification,
- confirming their ideas related to practice owing to experienced teachers.

In the following paragraphs, these benefits will be discussed with existing literature and compared with each other.

The common outcomes obtained from two activity systems

One of the important benefits is "learning relationship between theory and practice" in classrooms. In both systems, preservice teachers have a chance of field practice and

learning the place of learning theories in practice. However, the driving forces causing this benefit are different in two systems. In the first activity system, the subject views videos and then comments on them by linking video teachers' activities to learning theories. In a similar study which used digital videos, Knight, Pedersen, and Peters (2004) found that all preservice teachers are able to apply some aspects of learning theory to real classroom events. In addition, they also transmitted some activities which they had learned in face to face undergraduate courses. However, in the second activity system, preservice teachers read community members' comments and compared their own preknowledge about theories with teachers' words. So, they made abstract theory more concrete. As a conclusion, these two methods, using of video case or experienced teacher, can be seen promising in preservice teacher education to be able to link theory to practice.

Second outcome is "having different perspectives and ideas" which comes out in both activity systems. Some studies revealed a similar code "new ideas" as a benefit of discussion list which was used in a similar way to this study (Spitzer & Wedding, 1995; Pennington & Graham, 2002). In traditional environments, preservice teachers may treat as what they see an individual style. Their opportunities to examine the particular teaching events and problems from multiple perspectives can be limited (Wang & Hartley, 2003). However, in these systems, different perspectives are obtained from different knowledge sources. In the first system, new knowledge sources are other university students and video teachers, while in voluntary participation term the sources are experienced teachers, academicians and other university students. As a conclusion, online communication tools can be seen as an opportunity to obtain different perspectives and ideas as a benefit of collaboration.

Major outcomes of the first activity system

There are lots of positive evidence to use video in teacher education (Wang & Hartley, 2003; Hewitt, Pedretti, Bencze, Vaillancourt & Yoon, 2003; Knight, Pedersen & Peters, 2004; Sherin & van Es, 2005). In this research study, three outcomes as a result of using videos were; beholding novel teachers' experience, not repeating faults in videos and visiting various teachers' classrooms. The first one is *beholding novel teachers' experiences*. Some of the video teachers were student teachers who attend schools as a part of the "School Practice" course. Therefore, preservice teachers obtained novice teachers' experience in the first activity system. This outcome is similar to results of micro teaching. Micro teaching was invented in the mid-1960's at Stanford University by Dr. Dwight Allen and aims to help a student teacher to learn his/her lacks by viewing recorded videos of their own teaching. Owing to this method, the other student teachers in classroom view this student's faults

(Kazu, 1999; Akkul & Zerayak, 1999). This benefit of micro teaching is similar to aforementioned outcome of the first activity system. In other words, preservice teachers experienced a novice teachers' practice and drown lessons from novices' faults. In addition, video content whose teacher is a student teacher or an experienced teacher lets preservice teachers learn *not to repeat faults in videos*. Furthermore, preservice teachers do not have opportunities to see alternative ideas in action (Wang & Hartley, 2003). In regular classrooms, preservice teachers placed in isolated classrooms and they can observe only one teacher's teaching experiences. In this study, viewing different videos provided an opportunity to *visit various teachers' classrooms* although they could observe only one or two in their school practice course. This video related outcome and the discussed outcome having different perspectives and ideas" is an evidence of how preservice teachers will have multiple perspectives in online communities of practice environments owing to both other preservice teachers and video teachers.

In this study, *obtaining knowledge about new curriculum* is another outcome of the first activity system. In the context of this study, the elementary education curriculum has been changed by the Ministry of National Education in 2005 and this new curriculum which is based on constructivist principles has been an unknown challenge for teacher community. Preservice teachers have started to know about it yet owing to their preservice courses and arranged workshops. That is, new curriculum knowledge as an innovation has entered in a way of diffusion among teacher community. This process can be best explained owing to Rogers' (1995) change theory. Rogers (1995) said "diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system. It is a special type of communication, in that the messages are concerned with new ideas" (p.6) and "Communication is a process in which participants create and share information with one another in order to reach a mutual understanding (p.7)". Communication which was emphasized in this theory has been the core of this dissertation. The PDC environment which lets members communicate/interact with each others and discuss on special topics accelerated diffusion process. That is, the PDC has a big potential in diffusion of innovation. Similarly, an educator emphasized the importance of collaboration which is widely seen as a diffusion tool to implement change effectively, which introduced from outside (Hargreaves, 1994 cited in Parr & Ward, 2006). In addition, other educators also used web supported professional development environments to diffuse an innovation among teachers. For example, Indiana's Inquiry Learning Forum Portal which includes inquiry based authentic videos aims to improve student learning by supporting teachers in better understanding inquiry-based teaching and learning (Barab, MaKinster,

Moore & Cunningham, 2001; Moore & Barab, 2002). In sum, this benefit showed that web supported learning environments can be used for diffusion of innovation.

Major outcomes of the second activity system

The outcomes of the second activity system are learning the place of the theories in the practice, having different opinions and ideas, learning different topics, keep up to date, belief modification, confirming their ideas related to practice owing to experienced teachers. First two outcomes were also observed in the first activity system as previously discussed. Last three outcomes were discussed in following paragraphs:

The first outcome is *learning different topics*. The results showed that the discussed topics in the second system were more attractive than being in the first system for preservice teachers since the participants were a bit familiarized with the topics of first system. In the first system, the topics are substraction, symmetry, capacity of a cupe, and tangram while in the second activity system students' attitudes toward mathematics, multiple intelligence and mathematics, fractions and misconceptions, drama and geometry. The participants emphasized especially drama and mathematics topic among the topics. They first hear this topic and thus believed that they could learn different topics owing to the PDC. Indeed, this outcome could come out in the first system if the researcher selected this topic as one of the discussion topics. This result showed that introducing different teaching topics is possible owing to online collaboration tools.

Belief modification is an important focus of teacher educators. Studies showed that preservice teachers develop their beliefs of teaching long before they enter university. Therefore, changing their teaching beliefs and make them open to learn about new teaching methods has been an important focus of education (Cochran- Smith, 1991 cited in Wang & Hartley, 2003). In this study, belief modification has been one of the outcomes of the second activity system. One of the active members said "Drama and mathematics. I thought that it was difficult to prepare such a lesson. But I understood that it could be". This quotation showed how this student's belief to use Drama in Mathematics changed. Owing to discussion list, lesson plans and activities can be sent to all members. This attachment opportunity allows members of an online community see other members' products and so something seems unbelievable can be more concrete. This outcome was not observed in the first activity system because of the reason which stated in previous paragraph. Preservice teachers are a bit familiarized with the topics in the first activity system owing to their preservice courses or arranged workshops about new curriculum. So, their belief about the topics in the first system may have been already changed. However, drama and mathematics

is completely new topic for them. In sum, beliefs on new teaching topics or methods can be changed owing to online collaboration tools.

In traditional environments, teachers gain field practice by experiencing in schools and by talking with other teachers in time. However, preservice teachers have limited opportunities to obtain practice from experienced teachers. The PDC environment lets preservice teachers *confirming their ideas related to practice owing to experienced teachers*. So, they formed their ideas and beliefs by comparing their ideas with other experienced teachers.

5.2. Four sub-activity systems

Once two activity systems for preservice teacher education were produced (Figure 5.1) the activity systems were broken down into four sub activity triads. In these triads, the subject and the object remained stable since they were main elements of activity system while the mediators (tools, rules, community and division of labor) changed. The main reason of selecting only these triads is to focus on the relationship between preservice teachers and knowledge sharing and creation which was mediated by other components of activity systems. As a result, following sub-activity systems will be examined:

- subject-tool-object,
- subject-rules- object,
- subject-community- object and
- subject-division of labor- object.

Subject – Tool – Object

In the last decades, educators and educational researchers have used some community based tools to enhance student learning in online environments. In this study different tools were used to be able to reach the object in two systems. In this part of the study, how these tools were used to reach the objective will be discussed. So, tools used in two activity system will be discussed separately.

First activity system

In the first activity system, the main tools were digital videos and discussion list. *Digital videos* were recorded in real classroom environments in the public schools under the

Ministry of National Education. Then, they were added under the video part of the PDC portal. Each video includes new activities from the new mathematics curriculum which was initiated in 2005. The videos do not include a talking head who presents information directly to viewers. Instead, they present complex classroom dynamics with their teachers. Zooming in and out attribute of video camera lets viewers see different details in the classroom as much as possible. In knowledge creation process, videos can be seen as tools which make tacit knowledge of video teachers more explicit. That is, they are externalized knowledge sources. By using videos in the first activity system, preservice teachers obtained video teachers' classroom experience and think as if they were in a classroom with teachers and children. Owing to prompts which the researcher advised the participants to use while they viewed the videos, they entered a social classroom environment with the onscreen teacher and benefited from field practice. Therefore, it can be said that preservice teachers obtained video teachers' externalized tacit knowledge and internalized them. In addition, signs in the videos positively affected preservice teachers' professional knowledge. For example, video teachers' physical movements had been one of the discussion topics. Preservice teachers gained some cues about what should do and what should not do in classrooms. Furthermore, the results revealed that the participants emphasized the importance of digital videos in preservice teacher education when they compared two activity systems. That is, digital videos "represent knowledge in ways no other medium can" (Bieber et al, 2002).

Contrary to these potential benefits of videos, in some situations, using videos in online discussions hindered knowledge sharing and creation process. First of all, even if how much videos let preservice teachers feel a classroom environment, there is a lack of interaction between preservice teachers and video teacher and children. This factor decreased benefits which would be obtained from videos since preservice teachers observed classroom environment behind a screen. Second problem is related to technological issues. Both infrastructure of the universities and whether or not preservice teachers have a computer with the Internet is very important. In this study, although the participants had a laboratory hour in their universities to view the videos, most of them did not prefer to use these hours. Instead, their homes or Internet cafés were more attractive places for them. In addition, not only infrastructure but also technology skills of preservice teachers have been another important factor to view videos. If preservice teachers have low technology skills they cannot overcome video related problems such as video streaming, hearing the video's voice, etc. The last problem is limited view angle of video cameras. Aforementioned zooming in and out attribute of the video cameras cannot be sufficient to capture all dynamics in very active lessons. Capturing all movements of teachers and all children in a classroom is not possible.

Discussion list is one of knowledge management tools that allow community members' interaction with each other asynchronously. In this study, discussion list was selected as an asynchrous communication tool since bringing together preservice teachers from three different universities synchronously is not possible because of their tight calendar. Through discussion list, a member can send an e-mail message to a single e-mail address and it is delivered to all community members. If community members have a response or comment, they can reply to the message. Their response also will deliver to all community members. Through discussion list, preservice teachers have a chance of discussing on cases and sharing sources with other community members. In knowledge creation process, this collaboration is called as sociability. This sociability opportunity sparked a warm communication among a few of them. This friendship beginning with a mandatory participation continued in the voluntary participation term. These participants were happy to see each other' mails. The participants also emphasized that if they had a chance of knowing each other closer, the discussions would be made in a warm environment in the first activity system. This result showed a problematic way of discussion list. If community members do not know each other before participating discussion list discussions, discussion list may not let them to meet others closer. Therefore, during the discussion, community members should be supported with additional tools or face to face meetings. In addition, one of the main features of the discussion list is its archiving characteristics. So, the discussion list has been a knowledge source for preservice teachers when they need to look history of messages. That is, tacit experiences being explicit in message text are internalized by reading and then using them in classroom environments. Nicholson and Bond (2003) found that computer mediated communication extended discussions beyond classroom environment. In other words, web supported communication tools provided an opportunity to preservice teachers to extent the discussion beyond classroom. Furthermore, in this system, discussions extended beyond discussion list discussion. Some participants shared their experiences with other teachers and students out of this environment.

Second activity system

Because of technical problems with videos and the idea which newcomers would also experience the same problems, in this term viewing video option was cancelled by the researcher. Instead, in the second activity system, the main tools are scientific publications, library of the PDC portal and the discussion list.

Scientific publications which were used in this study includes scientific results from the classroom such as the children's mistakes in exams about fractions, lesson plans which shows how drama can be applied to geometry, etc. These materials include practical

knowledge from the classrooms. Using these kinds of materials in this system presented preservice teachers profed tacit knowledge from classroom environments.

Library part of the PDC has been an emergent knowledge source owing to first activity system and new discussions in the second activity system. Although the researcher did not try to promote this part, preservice teachers tended to use it frequently. The library includes various documents related to mathematics education such as lesson plans, mathematics teaching software, computer aided instruction materials prepared by Excel, etc. In addition, the lesson plans which were produced in the first activity system have been added in this new environment. With the getting rich of the library, preservice teachers visited especially this part when they connected to the PDC. So, the library has a potential of combination and internalization of the materials. Each participant can obtain explicated tacit knowledge from the sources and can adapt them according to her/his experiences. That is, preservice teachers combine their own experience with knowledge in sources and thus they can reconfigure them by writing a new lesson plan. If they do not compose a new source from the old one this process is called as internalization since there is a learning process of the source.

Mechanism of the use of discussion list was similar to the first activity system. In addition, in this system, preservice teachers could communicate with experienced teachers and academicians through this tool. That is, their sociability increased. Also, because of voluntary characteristics of the activity system, discussion list allows to discuss on additional discussion topics. There are simultaneous discussions in discussion list since different member groups may draw discussion topics to different ways. Therefore, in knowledge creation process, the subject learns to look at the same topic in different view points. Another beneficial feature of discussion list is that sent messages go directly to private e-mail accounts. It has both positive and negative results. As a positive result, discussion list messages may take attention of members and so they need to read them. However, majority of individual messages may bother the subject when she is not interested in specific discussion topic or she does not have time to follow e-mails. Therefore, s/he may request to leave from this system.

Conclusion of Subject-Tool- Object

Videos and the library part of the PDC have been two outstanding tools of two activity systems. Owing to videos, preservice teachers enter in a social classroom environment and obtain tacit knowledge of video teachers. In addition, videos can be used a tool for teaching other teachers' experiences, not repeating the same faults in video cases and obtaining various teachers' experience. However, videos can bring some problems to the

activity system such as technical problems, lack of interaction with video teachers, lack of capturing all dynamics of video classroom. When the benefits of videos on preservice teachers' knowledge sharing and creation process compare with scientific publications which can be used in the voluntary term, advantages of video can be observed clearly. As a conclusion, under these circumstances, videos can be more effectively used especially in mandatory design. In addition, practitioners should take into account some strategies to overcome video related problems. First, they should create a video team. The responsibility of this group is to record videos, transfer them into digital format and publish in the portal. Capturing all movements in a classroom with video cameras can be possible by using more than one video camera. In this time, practitioners should keep in their mind that combining two records take more time than analyzing only one record. Second, video streaming is big problem to view videos. Therefore, arranging a laboratory hour is very critical similar to this study. However, this does not ensure preservice teachers view videos. Practitioners should investigate their target population Internet opportunities and find solution according to their own context. To overcome lack of interaction between the participants and video teachers, video teachers can be invited to participate to discussions at the end of the discussion period for a few days. In this point it important that these teachers should not participate to discussions from beginning to end because preservice teachers can hesitate to discuss on them. Second outstanding tool was the library part which is a rich knowledge source for preservice teachers. They mostly interested in especially this part of the portal. Making this part of the portal rich is important to keep attention of preservice teachers to the PDC. Newcomers will also mostly interest in especially with this part. Otherwise, interest to the library will diminish in following time. Therefore, a content developer team should be used. This group should search new and interesting materials to be able to compose a knowledge base in the portal.

Other tools which can be used in these environments are discussion list and scientific materials. The results of this study showed that discussion list was a very effective tool to mediate the relationship between preservice teachers and knowledge sharing especially in oCoP environments. This tool allows developing sociability among members and thus, knowledge creation and sharing can be achieved in a most effective way. In addition, another advantage of this tool is asynchronous communication. The practitioners should use this tool when they can not arrange a synchronous discussion time. The most important disadvantage of this tool may be majority of accumulated messages when participation to a discussion topic is too much. Therefore, a technical support team should set the message delivery type to daily digest when a member bothers with these messages. In addition, although this tool let sociability among members who are far from themselves, in a

short time, developing a robust relationship among members by using this tool is not possible. Therefore, community members can be supported by a synchronous chat or face to face meetings. In addition, out of field discussion topics may be beneficial to know each other closer. In this study, scientific publications were used instead of videos in mandatory term. These tools are very affective to start a discussion. Teachers can find some cues, which are close to their ideas or reverse their experiences. So these materials provide an opportunity to knowledge sharing and creation.

In addition to tools' effects on the relationship between preservice teachers and knowledge sharing and creation in mathematics teaching practice, using technological tools which the participants were not familiarized with before caused additional results. Schaler (2002) defined this situation dealing with "overhead" activity before starting to deal with real object. In the beginning of the mandatory participation term, only half of preservice teachers had a home computer with Internet connection. Besides, the average of Internet connection duration of the preservice teachers was five hours in a week. These results are consistent with other studies (Baran, Kilic, Bakar & Cagiltay, 2005, Goktas, 2006). Since preservice teachers had a chance of obtaining experience of web supported learning environment owing to the mandatory participation term, their technology use skills developed. As well, a few of them bought home computers with the Internet connection at the end of first term. That is, preservice teachers' entry characteristics in the second activity system changed owing to the first activity system. This result showed a connection between two activity systems. In the first activity system, the subjects with their existing characteristics entered the activity system and owing to the Internet tools and computer software which the subjects had to use to be able to accomplish the object, they more engaged in technology. So, as an unexpected outcome of the first activity system, the subject with developed technology skills welcomes the community in the second activity system. That is, this renewed group of preservice teachers enters to the new activity system as the subjects who have different entry characteristic from the first system.

Subject – Community – Object

The role of communities in two activity systems can be best explained by the help of the concept `Zone of Proximal Development` which was developed by Vygotsky. This concept shows the distance between what an individual can achieve one self and what she/he can achieve by the help of others. That is, this idea shows that preservice teachers will learn more by social interaction than individually. In two activity systems, the researcher tried to

compose rich communities, as soon as possible, so that members of them could contribute to each other's professional knowledge. In this part, to which degree sociability is achieved in two activity systems will be discussed.

In the first activity system, community members were preservice teachers from three different universities and two different departments. When the goal of a preservice teacher aligned with the object of this activity system, s/he easily adapted to this system and participated in activities with other community members. How her/his goal was the same with the object of the activity system? First of all, the preservice teacher who was a life long learner was open to learn and thus s/he was willing to participate to the activities since s/he already searched alternative source of knowledge on the Internet. Second, s/he wanted to graduate and thus know that s/he had to get a good grade from her/his undergraduate courses. Even if her/his expectations were not coincide with the objective, social relations and pattern of interaction, the mandatory constitution of the activity system had forced her/his to participate to the discussions with others. Moreover, if mandatory participation was not a valid reason to communicate with others, the preservice teacher remained as a lurker in this activity system. In addition, being from different universities caused polarization among members. This study showed that some preservice teachers got a defender position of their own university students againts to other community members. In addition, the limited number of preservice teachers also tries to benefit from others' background by asking questions or communicating them with private messages. In this activity system, community sense among the participants was not formed completely. Therefore, learning in this sociable environment was limited with knowledge sharing which their responsibilities brought. Extended knowledge sharing between the preservice teacher and community members remained limited. The emerging reason for this was existing strong communication link within own group members. That is, from four years these preservice teachers got courses with the same people and shared anything with them. However, they know other people in short time. Therefore, practitioners should give more time to establish good communication among community members.

Community members of the first activity system formed a part of community of second activity system. Later, new community members who composed from experienced teachers, academicians and other preservice teachers participated among these existing members in time. In this new activity system, almost all prior community members preferred to be lurker. However, a few active preservice teachers were more willing to participate to discussions than being in the first activity system. In this environment, these preservice teachers produced and reproduced ideas with the help of this rich community. In knowledge creation process, sociability played an important role since preservice teachers exchanged

their tacit knowledge with others' tacit knowledge owing to conversations. In this study, it could be observed this mode of knowledge creation in the questions of the members. When a participant asked a question, s/he got the answer from the community certainly. This shows that some people in online communities of practice had good empathy skills. They think themselves in the shoes of others and they find a reason to help them. In addition, collectivism sense of some people forces them to help other people. They want to be beneficial to teacher community to bring the country in a step further. Lastly, the reason of being helpful to other members can be a desire to have a reputation in this community. Preservice teachers know that their Instructors follow messages. Therefore, they may want to seem their instructors knowledgeable. In addition, mutual conversations occurred between them and community members when they discussed on topics.

In both activity systems, discussions extended to out of discussion list discussions with different aims. In the first activity system, although community members were limited with preservice teachers who participated to the PDC in an undergraduate course frame, they shared the PDC experience with other professionals out of these environments. For example, some preservice teachers mentioned the PDC to experienced teachers who they meet when they went to practice school and other university students out of this environment. So, the subject-community-object triad enlarges to other individuals out of the environments. However, in the first activity system, there is limited number of private messages between the subject and community members. In these messages, the subject requested some course materials or ideas about how their courses are conducted from others. However, in the second activity system, discussions which first sparked in the discussion list easily extended in private messages.

Conclusion of Subject- Community- Object

Community sense among community members was explicit especially in voluntary term rather than in mandatory term. In the first activity system, separating preservice teachers according to their universities has been one of the factors decreasing community sense. Every preservice teacher needed to support their own university in this university based groups. Therefore, three heterogeneous groups which include different preservice teachers from different universities can be more beneficial to increase community sense. Thus, sociability among community members will increase. In contrast to this term, in voluntary participation term, preservice teachers felt themselves as teacher candidates in a larger community. Therefore, active preservice teachers could benefit from other members of this activity system as much as possible. As stated before, the most important disadvantage

of this term is decreasing participation to discussions. Therefore, it is not true to say that all preservice teachers benefited from sociability in the second activity system.

Subject – Rules –Object

Rules were another mediator between subject and object. In the first activity system, the rules are researcher centered design decisions. Three of them will be discussed: 3 e-mail rule, strict discussion duration, determined responsibilities. In the second activity system, rules were emergent and community defined norms.

First activity system

The first rule was posting at least 3 messages in each discussion period. This rule got a place in this activity system by the suggestion of one of the course instructors who had experienced a similar environment during his PhD education. Owing to this rule, it was expected that each participant would send at least three messages to the discussion list in each discussion period. The aim of this rule is to compose a discussion environment in which the subject and other community members interactively discuss on video cases and exchange knowledge sources. Furthermore, this rule would let the participants think about the dynamics of video classroom in more detail. This rule got some negative reaction from the subjects. Once they could not find additional ideas to write since three email necessities was very much for each video. Discussion list message history also showed that some preservice teachers sent messages, consecutively without reading prior messages. However, some of preservice teachers supported this rule and stated that this rule was a necessity to make preservice teachers send messages to the discussion list. Otherwise, none of them would send any message. In sum, it can be seen clearly that forcing preservice teachers to write because of making active them brought some problems in knowledge creation process. It was hoped that it speeded up internalization process but it hinders sociability among members because of multitude of messages which will be read.

Another rule is strict discussion duration or structured discussions. The aim of this rule is to let preservice teachers view selected four videos in the fall term. If the periods were flexible, the discussion would be extended and thus preservice teachers might not view subsequent videos. By watching more videos preservice teachers observed more real classroom environments and experienced more teaching activity. The results revealed that some participants criticized the short length of each period; some of them wanted to view more videos. This result is completely related to their technological background and internet

access opportunities. Preservice teachers, who have high technology skills, preferred to view more videos and discuss on them, while other preservice teachers who have low technology skills bothered to view videos in determined period. In addition, if the participants' internet access frequency is low, they face lots of e-mail in their inbox. Therefore, preservice teachers believe that if the discussion period is longer, daily e-mail quantity will decreased.

The last rule in this term is determined responsibilities of each preservice teacher. In this system, each of them knew her/his responsibilities in each period. The researcher also reminded responsibilities in the beginning of each period. This rule provided coordination between preservice teachers and community members. So, complex process in this activity system became easier and understandable. Furthermore, in the last period, when the researcher did not remind their lesson plan sending time to preservice teacher, none of them did not send any material to the list. This result showed that. Preservice teachers strictly waited continuation of the behavior.

Second activity system

In the voluntary participation term, rules were emergent and community defined rules. Previously, how these rules were formed was discussed under the rules heading. In this activity system preservice teachers did not direct any criticism towards community defined rules. They accepted them easily and adopted them as being. If they bothered them they tried to change it or prefer to leave from the community. Community defined norms makes easy the life of its members in the process of reaching the object. Therefore, the rules which the participants have to obey should be determined by preservice teachers. This bottom up rules will also be beneficial to motivate unwillingness preservice teachers to participate discussions.

Conclusion of Subject-Object-Rule

When the rules in two activity systems are evaluated as whole, it can be seen that community based rules are easily adopted by preservice teachers. This was completely an advantage voluntary term. For example, 3 messages posting rule, strict discussion duration were explicitly criticized by the participants. Rather than top-down rules, bottom up rules has been used in these systems. In sum, the rules should be determined by preservice teachers before the application in mandatory term. Furthermore, in this term participants may determine some punishments for passive members.

Subject – Division of Labor (DoL) –Object

In two activity systems, division of labor affected preservice teachers' knowledge creation and sharing form. In the first activity system, each participant in university based groups had different responsibilities. In each period, two of the universities commented on video teachers' classes while the other university produced an improved lesson plan based on discussions. Therefore, there were two main duties: comment writer and lesson plan producer. In the system, after viewing videos, if the role of preservice teacher is comment writing s/he externalized video teachers' experience from videos by writing on them. In addition, they had to add their own comments on the video teachers' experience. Therefore, externalization process had been more robust. Lesson plan writers read coming messages after viewing the videos. Then, they produced an improved lesson plan combining their experiences with coming comments. This is a combination and socialization process. The activity system has a curricular process, each subject benefits from the outcome of each role.

In the second activity system, division of labor was an emergent attempt. There were discussants, material sharers, and lurkers in the system. That is, some subjects prefered to be in a social environment and thus participate to discussion with community members. They comment on topics and criticize others' comments. There is a socialization process in their behaviors. Material sharers sent their lesson activities or lesson plans to the discussion list. So, they made their tacit more explicit. Lastly, there are lurkers in the environment. These individuals neither participated in discussions nor shared any material with others. There is a one way benefit in this role. Similar to first activity system, all roles have a curricular process. Preservice teachers change their roles whenever they want.

Conclusion of Subject- Division of Labor- Object

When it is compared the effect of DoL on knowledge creation and sharing in two terms, advantage of DoL in mandatory term can be seen obviously. First, each of members has an active role in knowledge creation process. However, in voluntary term, majority of lurkers shows that most of the participants have a passive role. The mediator, division of labor, between preservice teachers and knowledge creation and sharing reaches its aim with active participation of preservice teachers. Since working in a harmony in different roles will be a desirable outcome of online communities, practitioners should design carefully the roles of community members.

5.3. Motivators and barriers for being an active member of the community

From this point, both the design decisions and the results of the study were discussed in the lens of activity theory framework. By dealing with some similar issues, this part will summarize motivators and barriers which affect preservice teachers' activation in two systems. In addition, some of these factors affecting quality of knowledge creation and sharing will be presented. In this part, rather than separating two activity systems (mandatory or voluntary participation terms) general motivator and barriers will be presented. If a motivator belongs to only one activity system, the system of this factor will be emphasized.

The motivators which encourage the subject to be active

A tentative model which shows motivators is presented in Figure 5.2. The motivators are categorized as inter-personal, personal and environmental. In the following paragraphs, these motivators will be discussed.

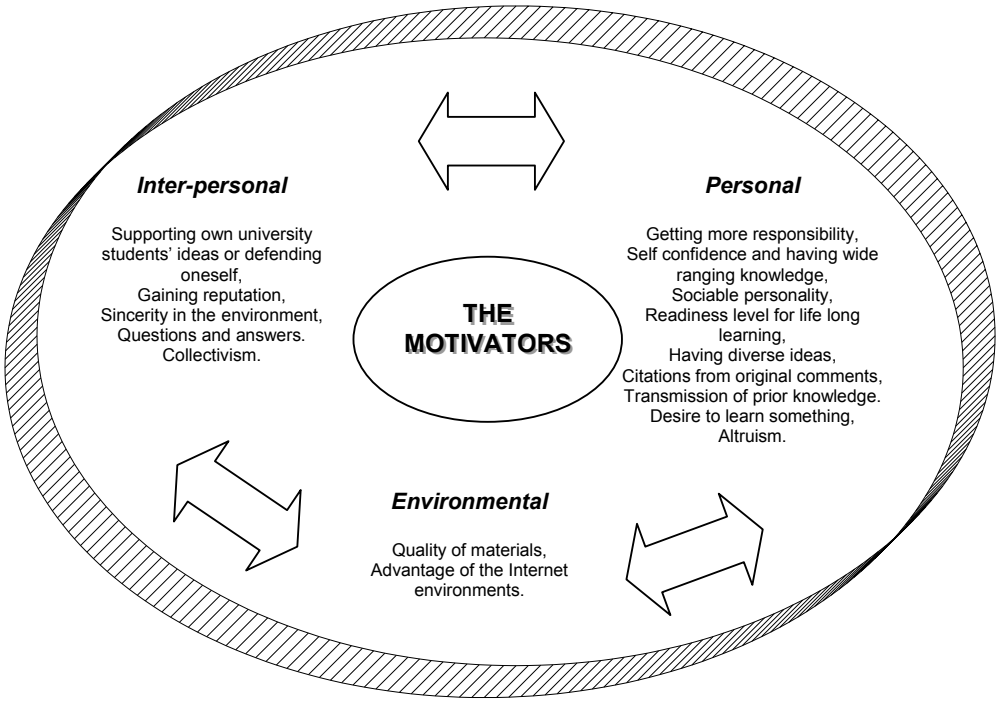


Figure 5.2 The motivators which make preservice teachers active and increase quality of knowledge sharing.

Interpersonal Motivators

The first motivator related to interpersonal issues is *supporting own university students' ideas / oneself*. In the first activity system, since preservice teachers were grouped based on their own universities, when one of the groups' members had stated an idea, the others felt a need to support this idea. Although this polarization increased participation amount of the participants, it is not always a desired motivator because it decreases community sense among the participants. In the second system, preservice teachers were individual members of the system. Therefore, they supported only their own ideas. In sum, the results revealed that preservice teachers supported own ideas when they are either a part of a group or individual members in oCoP environments. In the defending process, they search new evidences, inquire opposite ideas and compare two ideas. Therefore, designers should encourage preservice teachers to support their own thinking. To accomplish it, a discussion moderator can ask more specific questions to them about their opinions.

Another motivator is *gaining reputation*. The importance level of emergent knowledge is different for each of community members. Therefore, when a preservice teacher read a comment or an activity, her/his reaction to it was different from others'. In other words, if s/he found shared knowledge valuable, s/he might feel a need for thank or reply. In this point it cannot be forgotten that this behavior can make the preservice teacher an active member although this behavior does not produce a valuable knowledge. However, other community members to whom the preservice teacher thanked are reinforced to share her/his knowledge sources with others in following time. Indeed, this behavior means that reputation of a preservice teacher will increase owing to his/her contribution to messages and other people will be motivated owing to this behavior. The more community members' reputation increase the more sincerity in the environment will increase. Therefore, practitioners should develop strategies/mechanisms to increase reputation in online communities of practice environments. The most powerful way can be using discussion moderator as a model. The moderator should frequently thank community members for their participation, materials or ideas. In addition, s/he should participate in discussion with others.

Sincerity in the environment is another motivator which made preservice teachers more active in oCoP environments since they wanted to feel sincerity in the system to participate in discussions or to share own resources with others. That is, before sharing their knowledge, they want to know whether or not others set a high value of them. Similarly, Hew (2006) reveals that "the respectful environment" in which other members honor people' opinions even if they may not agree with their opinions is one of the factors increasing knowledge sharing. In daily life, people want to know other people to believe their sincerity.

Similarly, in oCoP environments, preservice teachers need to know each other to feel closer. In this study, the researcher used an introductory discussion period in which every preservice introduced her/his self to others and an icebreaking face to face meeting at the beginning of the term in the first activity system. However, these attempts were not sufficient for warm relationships. Through the end of the first term, a new face to face meeting could be more beneficial since preservice teachers began to familiarize with each other from discussions and a curiosity about others was formed. In this study, testing this strategy was not possible. In sum, designers should keep in mind that developing sincerity among preservice teachers will need more time than their expectation. Several strategies can be proposed for developing sincerity. At first, introducing themselves in the first discussion period is very beneficial to know each other. Alternatively, in the forum part of the PDC, preservice teachers can introduce themselves to other people. When a preservice teacher wants to learn the profile of another, s/he can examine this part. This is the first step of knowing each other since learning another' identity is not sufficient for sincerity. Preservice teachers will need to know more detailed information such as their social relationship or their life view. Therefore, face to face communication seems to a must. However, this may not possible in oCoP designs. Therefore, video conferencing system or synchronous chat can be arranged regularly. So, to second activity system sincerity among participants can partly be set up. To make robust sincerity, in the second system, similar strategies should be applied to new community members.

Questions and answers is another reason to be active in two activity systems. The results revealed that preservice teachers asked questions with two aims. One of them is asked because of a desire of being applauded by others. That is, they waited approval for their messages instead of real answers to their questions. Secondly, preservice teachers, who may be called as knowledge seekers who really wants to get an answer and obtain others' experiences. Kurtts, Hibbart and Levin (2005) discussed in their study whose sample compose from preservice teachers from different departments that the participants asked some question to each other. To them, this showed a movement to a collaboration role. In addition, Hew (2006) found the interest of knowledge seeker is one of the motivator which forces a member to share knowledge. He explains that some members have questions and so they are curious. Therefore, people share knowledge because others want to know. In this study, existence of questions and members also shows that members are in the way of being an online community. As discussed in subject- community- object section, in the first activity system community sense was not developed very well while in the second activity system, members moved with the community sense. Furthermore, the participants answered them when other community members asked a question. However, some of first type

questions are looked down by community members and they omitted these questions. This results shows how members of online communities differentiate valuable questions from insignificance ones. Therefore, designers should motivate preservice teachers for being knowledge seeker. Examples of good questions and insignificance questions should be shown to members.

Collectivism means "motivation with the ultimate goal of increasing the welfare of a group or collective" (Batson, 1994, cited in Batson & Ahmad, 2002, p.437). This study revealed that some preservice teachers wanted to be beneficial to teacher community. In other words, they participated in the discussions and sent materials to the system because of commonality of teaching issues which most of them face. Similarly, Hew (2006) also determined this factor as one of the motivators of people in discussion list to share knowledge. He stated that in online communities, collectivism can be supported by a moderator or frequent knowledge sharer. In addition, research studies showed that the more people committed to welfare of a group the more they will share knowledge in online communities when they had benefit from the group in the past (Cheung & Hew, 2004). Therefore, increasing collectivism sense among community members is very important in online communities of practice environments. A practical solution to increase collectivism sense may be letting preservice teachers see outcomes of their knowledge sharing. If they see good results of their participation to discussions they can be more motivated. Library part of the PDC is a true place to accomplish this. After each discussion period, important and valuable points coming from members can be published in the portal. Furthermore, if the moderator starts discussions about what community members learned from other regular discussions and how they use them in their classrooms, developed welfare of community will be exhibited to all community members. So, motivation for increasing welfare of teacher community can increase.

Personal Motivators

The first motivator is *getting more responsibility*. If preservice teachers get more responsibility in online communities of practice, they will begin to search alternative topics or activities to enhance environment. In other words, when they feel that their existence in the environment directly affects other people contribution to the system, they will be more motivated and feel as a part of the system. Therefore, practitioners of oCoP environments bring some members more active roles in the systems. The profile of this type of members is hidden in the following two motivators.

Self confidence and *having wide-ranging knowledge* are two interrelated personal motivators to participate discussions. The results showed that if preservice teachers believed

themselves they would have not avoided putting their opinions in front of the community. In addition, having wide-ranging knowledge about discussed topic also makes preservice teachers more active members during discussions. However, neither self confidence nor having wide ranging knowledge stand alone is not a motivator to be active since these two factors as a whole force the subject to share knowledge with others. Similarly, Jakobsson (2006) revealed in his experimental study that self confidence is an important factor in net based environments. Similarly, Hew (2006) revealed that outspoken personality of discussion list members increased to share knowledge with other members. These types of members are self confident and encourage sharing their knowledge without fearing. Therefore, these results show the importance of self assessment before starting design of an online environment. These types of members can be used as discussion moderators during knowledge sharing process.

Another personal motivator was more *sociable personality*. This type of preservice teachers easily adapted oCoP environments, communicated with other preservice teachers and shared knowledge in these environments. Vonderwell (2003) showed that in online environments if preservice teacher did not know each other before they hesitated to write each other. Therefore, sociable preservice teachers should use oCoP environments as a catalyst. They can make other introvert people more active with their messages. Therefore, practitioners should notice this type of people and used them a tool in the process of other community members' familiarization process.

Furthermore, preservice teachers' *readiness level for life long learning* has been very important motivator which directly increased their activation in oCoP environments. If preservice teachers accepted life long learning principle as a life view they wanted to develop professionally for their personal benefit. That is, grading is not so important factor for them. They do not see these kinds of environments as a barrier which they have to achieve to be able to graduate from university. Therefore, preservice teachers who see this system as a part of life long learning, participate to activities willingly and benefits from the community and the tools in the system. In online communities, some strategies can be used to make preservice teachers to notice the importance of being in these types of environments. In this study, the researcher arranged a face to face meeting for icebreaking among preservice teachers. In this meeting, the importance of oCoP could be discussed with them. The moderator can start discussion by asking "what do you expect from this environment? What can be the potentials of these environments?". Such questions direct preservice teachers to think about possible benefits of the system.

During discussion list discussions, if preservice teachers had had *a diverse idea*, they would have shared this knowledge with other community members. In this point, rather than

shared knowledge sources in the discussion list, preservice teachers' having different knowledge sources forced them to be active in two systems. However, some of preservice teachers did not share anything with others even if they had diverse knowledge sources. In this point, practitioners face with the question of how these types of members should be supported. First, the role of discussion moderators is very important. The moderator should ask questions such as "are there any other people who have different ideas or materials?". This type of questions may prompt community members to share their knowledge sources.

Making citations from original comment is a factor which influences quality of discussions rather than a motivator. The participants generally preferred to cite others' opinions in their comments in two activity systems. In the first activity system, this factor can be concluded both negatively and positively. First, preservice teachers made this because they had to complete three e-mails sending rule. Rather than thinking, inquiring or searching, they prefer to cite and add their comments on the original idea. The reason for this, some of them sent their messages without viewing video. However, citation also showed that preservice teachers read others' comments, compares them with their own beliefs and concluded on them. In the second activity system, citation emerged as rule since in time all members showed a similar behavior. If negative use of this factor is eliminated, it can be an important factor which accelerate knowledge creation and sharing process. Therefore, practitioners should take into account that some preservice teachers may send their messages without viewing videos or copying others' messages as being their own messages. The moderator of discussion list should send some warning and reminding messages about this issue to the discussion list during discussions.

Transmission of prior knowledge is another factor which affects quality of messages and activation of preservice teachers. Preservice teachers transmitted her/his prior theoretical knowledge or partial tacit knowledge to this system owing to tools, rules, community and division of labor. This behavior affected comments' quality positively. However, if they do not do this, their comments will be only opinion based. Furthermore, this is also a motivator to participate discussions. By using their prior knowledge, they can write his/her comments to send to the discussion list. This factor should be supported by discussion moderator. S/he should direct discussions to issues which let preservice teachers remember what they learned from their undergraduate lesson.

Another factor is *desire to learn something*. Some preservice teachers concerned with what other people know different from themselves. Therefore, they questioned other people ideas. Similarly, Hew (2006) reveals that one of the motivators to share knowledge in discussion list is personal gain. He describes personal gain obtaining more knowledge from the others. One of strategies to motivate these types of people is to come out different

knowledge sources. Therefore, planning of the discussions is very important. Discussion moderator should often ask question to different people for their opinions. Discussion topics should be appropriate to take attention of members having different perspective. Furthermore, a part which includes information about how every university conduct their undergraduate lesson can be created in the PDC portal after they discuss this issue in the discussion list.

Altruism's ultimate goal is "to increase the welfare of one or more individuals other than oneself" (Batson & Ahmad, 2002, p.436). In this study, altruism was also revealed as one of the factors increasing activation of preservice teachers in online communities of practice environment. Preservice teachers thought that other members need their materials or suggestions. Therefore, they want to be beneficial to them. Preservice teachers' empathy skills are very important to increase altruism. Hew (2006) also observed this factor as one of the motivators in discussion list. These types of people do not need to be motivated very much. They already participate to discussions and share their knowledge with others. A few attempts such as asking questions, starting new discussion topics may be sufficient to motivate them. These strategies can be similar to the strategies which were discussed in collectivism part.

Environmental

Quality of materials has been another motivator which will increase preservice teachers' participation to discussions in the first activity system. For mandatory term, video should let preservice teachers discuss a long time with other community members. In addition to good cases, teaching problems or learning difficulties which are shown in videos increase quality and quantity of messages coming from the participants. Therefore, in the selection of appropriate video cases designers should take into account richness of video cases. In addition, in every discussion period, different cases having different teaching strategies can be used. Similarly, for voluntary term materials should let preservice teachers discuss a long time with other community members. They are interested in especially topics which are not easy to teach. Therefore, general discussion topics should be selected among interesting topics.

Advantage of Internet environments has been another motivator which increases preservice teachers' activation. Preservice teachers comfortably express their opinions and ideas in the Internet environments because of anonymity attribute of asynchronous communication tools which does not allow to hear others' voice or to see others' mimics. However, in face to face environments, people preferred not to explain their ideas since they hesitate to break others' heart by their words. Some research studies indicated that introvert

people overcome shyness through asynchronous communication tools and become more active than being in face to face discussion courses (Palloff & Pratt, 2001; Nicholson & Bond, 2003; Vonderwell, 2003; Cheung & Hew, 2004). However, Davis and Resta (2002) examine influence of using e-mail to support novice teachers. To their findings, one of the challenges is difficulty in expressing all feelings via e-mail. Therefore, they proposed to make regular meetings in addition to the electronic collaboration. In a more recent study, while some participants emphasized the positive aspect of anonymity feeling, some participants point to importance of real time, face to face exchange (Cook-Sather, 2007). As a result, it can be said that Internet environments has an advantage on anonymity of people but also it has some limitations to express all opinions and feelings. Therefore, practitioners should keep in mind that their oCoP environments should include tools which allow developing social relationships among participants and expressing all feelings such emoticons.

The barriers which prevent preservice teachers to be active

With regard to low contribution and low quality of comments, a tentative model which is drawn from the results of this study is presented in Figure 5.3. The motivators are categorized as inter-personal, personal and environmental. In the following paragraphs, these motivators will be discussed with existing literature.

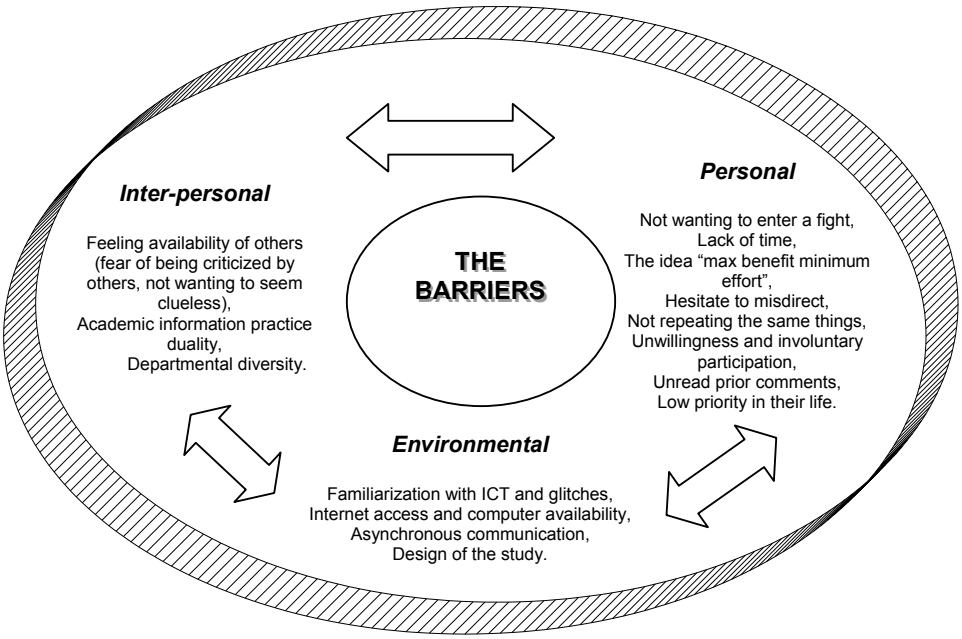


Figure 5.3 The barriers which make the subject less active and decrease quality of knowledge sharing.

Interpersonal Barriers

Members of oCoP feel explicitly availability of other community members in the activity system. They think two times before sending any messages or materials to the discussion list. They think that other people can *criticize her/his about her/him ideas*. Furthermore, since what others will think about their sharing is very important, they do not want to *seem clueless to others*. Because of people who may look down other participants, they prefer not to share her/his knowledge sources. Similarly, Hew (2006) revealed that arrogant attitudes are perceived by members that their knowledge would not be appreciated. In these situations, they prefer to be a lurker. So, designers should not allow arrogant attitudes in these environments. They should be a good mediator among members.

The second activity system includes people having different background (see community heading). In this complex environment, there are various viewpoints which every member has. For example, some experienced teachers believe that the real school environments are different from knowledge which is taught during university education. Furthermore, they believe that academicians still try to teach the same things to preservice teachers. However, academicians also criticize experienced teachers. Therefore, there are some belief differences between teachers and academicians. In this polarization, preservice teachers hesitate to reflect their opinions comfortably since they do not want to challenge to

either academicians or experienced teachers. Similarly, Makinster, Barab, Harwood and Anderson (2006) indicate that although preservice teachers gave a great value being with other people in the same platform, ILF prevented them from talking about certain topics or concerns. They, therefore, proposed to use at least two discussion forum which diverse students' discussions from public discussions. The results of the study indicated that most of the preservice teachers did not participate to voluntary discussions. Therefore, for mandatory term, this solution can be proposed. However, for voluntary design, this suggestion may not be a good solution. How we can demand preservice teachers to participate two discussion environments in case they resist to participate to only one discussion environment. Instead, responsibility of discussion moderators should be increased. They should be aware of existence of this type of problems and intervene to them and motivate preservice teachers to participate discussions. However, if practitioners plan to design a mandatory environment including teachers, academicians and preservice teachers, they can use this strategy.

In the first activity system, *Departmental diversity* has been an interpersonal barrier. This barrier is a design decision which was determined in the beginning of the study. The aim of this decision is to present more sociable and rich discussion environment to the subject. However, this decision may sometimes decreased quality of knowledge source in the system. First, similar studies came from the same university students. For example, lesson plans coming from one university students included the same example "lump sugar to teach children capacity of a cube". Secondly, every university students evaluated their contribution more effective and supported their own university students' ideas. As stated before, this situation increased their participation partly but synchronously community sense among preservice teachers decreased. In other words, this decision caused a polarization among members and thus decreased their activation in the system. Therefore, instead of grouping preservice teachers according to their universities more heteronous group can be designed. Every group can include preservice teachers from different universities in the same ratio.

Personal barriers

The first barrier is *not wanting to enter a fight* with community members while discussing with them. The results indicated that some preservice teachers believed that there is no end of debates. Therefore, they did not turn any reply to the other discussant in the middle of the discussion or even if they follow discussions they did not preferred to be in the middle of the debate. In that point, responsibility of discussion moderators gains importance. These preservice teachers should see positive ways of participating to these debates. Therefore, moderators should summarize discussions after they are concluded. In this summary, important point of the discussions, misconceptions, wrong ideas, and good

examples should be presented with a short way to all members. Seeing their ideas or sources' being published in the PDC, which emerged in a discussion, motivates them to enter new debates.

Lack of time is the second barrier which decreases to share knowledge both in voluntary term and mandatory term. In this study, fourth year preservice teachers' first priority in their life was to graduate from the university and then getting a good result from the KPSS which is an entrance exam before appointing as a teacher. Therefore, they focused on their undergraduate courses and preparation for KPSS rather than spending more time in these systems. Similarly, a research study reveals that the most frequently faced challenge to use e-mail to support novice teachers is the participants' finding time to get on the computer (Davis & Resta, 2002). To overcome this barrier, practitioners should work with lower level students. In daily life, every preservice teacher is a part of larger or smaller communities. These communities can be their families, schools, or favorite soccer teams' club, etc (Wenger, 1998, 2002). Priority of these communities in a preservice teacher's life is different for each of them. Some of them, social activities are important for them while some their courses gains importance. If web supported environments as a part of their school activities have *lower priority in her/his life* than other undergraduate courses or social activities, these preservice teachers' participation to the PDC activities will be low. This issue is a general problem of preservice teacher education. A solution to this problem is preservice teachers' gaining life long learning idea. Therefore, educational researcher should notice this problem and educate life long learners.

In addition, the results showed that most of the preservice teachers did not want to spend extra effort in voluntary oCoP environments. They preferred the easiest way to access to knowledge sources. Trying is not a desirable way of obtaining knowledge very much. That is, the idea *max benefit minimum effort* decreased their contribution to the environment. Therefore, in the design of an oCoP environment, practitioners should design very simple and easy understandable environments rather than complex environment. Similarly, Baek & Barab (2005) revealed that complexity design principles were criticized by online community members. So, preservice teachers who did not want to try to obtain or share knowledge can participate to discussions and shared their knowledge sources by less strenuous endeavors.

Some preservice teachers' knowledge sharing and participation to discussions decreased since they *hesitated to misdirect* to other community members. Similarly, Hew (2006) revealed that unfamiliarity with discussed topic hindered discussion list members to share knowledge since they did not sufficient knowledge about discussion topic. Indeed, this behavior of preservice teachers is completely true. If you do not know the reality you can

direct wrong ways other people. Therefore, practitioners should motivate them to keep these behaviors. However, the most important point whether or not their decreasing activation is because of their lack of self confidence. If so, they need to be supported to be an active member by discussion moderator.

Not repeating the same things is another barrier which decreased preservice teachers' contribution to discussions. During a discussion, preservice teachers searched new things to contribute to discussions. If they did not have new anything to say they kept their quiet since they did not want to repeat the same things. Similarly, Hew (2006) revealed that "no new or additional knowledge to add" is one of the barriers to share knowledge. To overcome this barrier, discussion moderator should support online community with additional materials. In rich online discussions, every member can find to say something. In addition, discussion topics should be different from each other. For example, in this study, the last discussion topic of the second activity system was students' attitudes toward Mathematics that let every member comment on it. These types of general issues can be selected to discuss as one of discussion topics through term.

Unwillingness and involuntary participation has a critical importance in oCoP environments. Unwillingness of preservice teachers who are mandated to participate to online discussions by researchers is a challenge not to be easy to overcome during the process. This barrier is pertaining to first activity system because of mandating participation. In this study, preservice teachers had a resistance to participate to discussions since they did not live such an experience before. This resistance might be related with their low technological skills. Practitioners should keep in their mind that all preservice teachers are still not at good on computers and the Internet technologies. These problems with technology cause different problems in technology supported/ based projects. More detailed, it causes lower expectations from electronic discourse experience (Killian & Willhite, 2003). Community members' attitudes toward technologies were also related to their performance (Knight, Pedersen & Peters, 2004). Consequently, the PDC activities are an additional burden to overcome for preservice teachers in this situation. In this new age which preservice teachers have been increasingly more component with technology use, if practitioners want to design an environment similar to the mandatory participation term they can offer an "*elective course*" which will take attention of interested preservice teachers who will be most probably technology literate since they will able to learn content of the course from their course catalog. If an elective course is not possible, practitioners should design additional materials to persuade participants on benefits of these environments. If they believe the importance their resistance can be broken.

Unread prior comments are a negative form of citations from original comments motivator. As discussed before, preservice teachers concluded others' messages and brought a step front their comments only if s/he read other's messages. However, in this activity system some preservice teachers may send their comments without reading prior messages. This directly decreases quality of knowledge creation process in the system. Furthermore, existence of these types of messages causes reactions to the owner of the messages in community members. Therefore, it negatively affects their participation to discussions in the system.

Environmental barriers

Familiarization with ICT and glitches is the first environmental barrier which affected quality of the discussions in especially in the first activity system. Prior poor computer literacy courses and prior low Internet and computer access opportunities were reasons of their unfamiliarity with computers. Preservice teachers could overcome some of technical problems which they lived in this environment but they were generally affected negatively. In addition, negative attitudes towards computers decreased quality of knowledge sharing. Moreover, some preservice teachers did not like to use computer based studying tools such as using keyboard or word programs to format text). Rather, they liked to use traditional working tools (handwriting, colorful pencils, etc). If they can not alter their traditional working habits, s/he will be exhausted to share knowledge sources. Under the heading subject-community-object heading, how preservice teachers' technology profile changed was discussed. After preservice teachers participated to a technology based course, their familiarization increased to this kind of environments. In sum, this study showed that technology was not a part of preservice teachers' life. They used them partly because of the researcher' mandating. Therefore, teacher educators should study on developing computer literacy of preservice teachers by embedded them in traditional courses.

Another barrier is *Internet access and computer availability*. The PDC required preservice teachers' active participation to discussions and thus active use of computers and the Internet. However, they had limited access to them. This study showed that if preservice teachers do not have an Internet access and a computer, their performance would decrease. In this point, most of the responsibility belongs to university administrators. They have to provide sufficient infrastructure to teachers of the future

Furthermore, the asynchronous communication tool (discussion list) had some disadvantages which may decrease preservice teachers' activation and quality of messages. The results indicated that because some preservice teachers did not frequently connected to the Internet, they had lots of unread messages when they opened their inbox. Therefore, they

preferred to skim over all of them rather than opening and reading each message. On the other side, the other preservice teachers waited reply to their messages. Similarly, some research studies revealed that preservice teachers' criticisms to delaying replies to their messages (Vonderwell, 2003; Cheung & Hew, 2004; Cook-Sather, 2007). Furthermore, the instructors' response time and grading had slowed down towards the end of the CMC courses (Graham, Cagiltay, Lim, Craner & Duffy, 2001; Vonderwell, 2003). Levin and Robbins (2006) investigated preservice teachers' reflective thinking versus synchronous and asynchronous online case discussions. The researchers determined that the number of participants preferring synchronous discussion increased after all participants' experienced synchronous discussion. The researchers recommended that the participants should be given an opportunity to participate both types of discussion. In this study, preservice teachers did not experience synchronous discussion. Therefore, it is not true to compare the asynchronous communication with synchronous communication but rather it is important to determine problems and form a base to make practical solutions. The context of this study was also a bit different from other research studies since there were three different university students. Therefore, arranging a synchronous chat hour which all preservice teachers participates is not possible for this type of studies. Similarly, Hough (2004) stated that asynchronous communication tools bring together teachers who would otherwise not interact. Therefore, a solution which proposes to use synchronous communication will not be realistic. Therefore, even if there should be some problems with asynchronous communication it is a must for these types of activity systems. In this point, designers should develop some instructional and communication strategies which will hinder delaying replies. First, attributed messages to public remained generally unanswered. Therefore, participants should be directed to write to specific people. Furthermore, they should use the names of other people in the text. Secondly, attributed messages to a specific preservice teacher should be different to others messages so that the preservice teachers can notice this message immediately, when s/he look inbox. To accomplish this, the participants may write "attention to Mrs/Mr XXX" in the title of the messages. There can be any other strategies.

The length of the discussion periods is another environmental barrier which was criticized by the participants. In this study, discussion duration for each video is two weeks in average. Some of them need more time for discussions while some evaluate this decision appropriate and want more video to view. Similarly, Jakobsson (2006) found that some of his participants frustrated to work through the Internet and the study pace have been too high. As concluded in this study, the pace of discussions was related to participants' technical capabilities and their access rate to the Internet. Because this PhD study included some participants who have low technology use skills and rarely connected to the Internet,

the pace was high for these participants. In addition, in this study every participant had to send at least three mails. According to results, some participants found 3 e-mails rule nonsense. This rule caused following results; ineffective comments, dividing whole opinions into smaller parts, similar messages, and out of topic e-mails. In other words, the quality has decreased in discussions. Therefore, practitioners should set their length of discussion duration according to their target preservice teachers. If their technology skills is high practitioners can decrease duration of discussions. In addition, the participants proposed to send two messages instead of three. This rule is also sense for discussions in the first term since one of them is for a new idea statement and another is for replying for another member.

5.4. Implications for the practice

This study is an example with two cases to practitioners, who are designers or teacher educators wanting to use online communities of practice environments in preservice teacher education. From this point, the researcher discussed the design decisions and the results of the study in the activity theory framework as a whole. Furthermore, in two activity systems, motivators and barriers which will force preservice teachers participate to discussions or share knowledge sources with other community members were presented. This section includes summary advices to practitioners about which aims they can use these environments in preservice teacher education and which points they have to take into account before and during the design of these environments.

Major aims to use online communities of practice in teacher education

This study revealed that online communities of practice environments could be used following aims in preservice teacher education:

- Teaching to apply some aspects of learning theories to real classroom environments,
- Creating a discussion environments in which preservice teachers can obtain different perspectives and ideas,
- Designing a learning environment similar to real life cases:
    - Letting preservice teachers obtain novel teachers' experiences,
    - Teaching not repeating the same faults in video cases,
    - Letting preservice teachers visit various teachers' classroom.

- Diffusion of an innovation,
- Teaching uncovered new teaching topics,
- Changing preservice teachers' beliefs on teaching practice,
- Letting preservice teachers *confirm* their ideas on teaching practice owing to experienced teachers.

Research team in oCoP designs and their responsibilities

This study was an individual PhD study. However, design of online communities of practice environments requires a persistent collaborative effort. According to the researcher' experience, working team of oCoP environments should have following compartmentalization of the responsibilities (Figure 5.4). Otherwise, research process will be very exhausted for an individual researcher or a designer.

At the top, there should be an administrator who adjusts the relationship between discussion list and the portal support groups. Discussion list group should compose from discussion moderators and a technical support team. The portal group should include content developer, digital video creation team and technical support team.

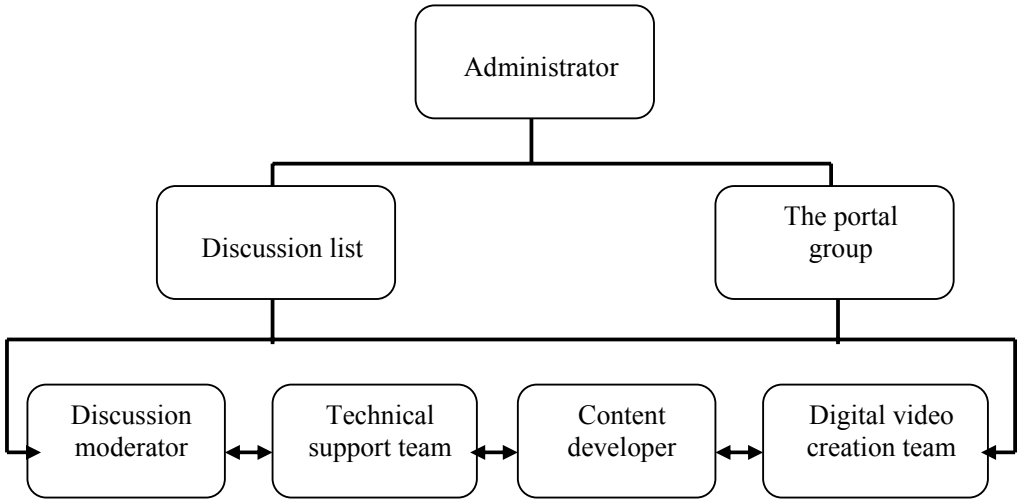


Figure 5.4 Project group of an oCoP design.

Discussion moderators are administrators of discussions. They can be only one person or a group of people. Their responsibilities are very critical to carry on discussions without any problem. In addition, effectiveness of discussions is completely pertaining to these people. In mandatory participation design, course instructors in the role of discussion

moderators may more motivate preservice teachers than a person out of their universities. In voluntary participation term, a heterogenic group should be selected among community members. As discussed before, some advices to discussion moderators can be,

- Ask specific questions to community members about their opinions,
- Thank community members for their valuable participation,
- Try to increase sincerity among members,
    - In the beginning of designing community, arranging a face to face icebreaking meeting,
    - Leave the first discussion topic to meet,
    - Arranging face to face or synchronous chat regularly.
- Leave one of discussion topics about how community members can benefit from oCoP environment,
- You can start a discussion about what is the content of courses which are offered in different universities. Community members can share their knowledge sources with other community members.
- Publish good questions which are certainly appreciated by community members and insignificance questions which community members will overlook,
- Publish a brief abstract of discussion which includes good point, wrong ideas, good knowledge sources on the portal,
- Set an info part to introduce new members and moderators of oCoP environment
- Give more responsibility some members who are self confident, social and have wide ranging knowledge
- Ask questions such as “are there another people to bring new view points to the issue?”
- Emphasize to community members that most valuable thing is their own thinking and experiences. Therefore, even if there is a mandating, they should produce only their own sources.
- Use cases which show different teaching practices or general discussion topics which every community member can easily participate to discussions.
- Select a discussion list which allow to use emotions,
- Do not take a place from one side in the discussions,
- Moderate arrogant attitudes,
- Do not make homogeneous groups. Instead heterogenic groups including people have different background will increase community sense among them.

- Select third grade preservice teachers instead of using fourth grade,
- Emend wrong ideas.

Content developers develop and improve library part of the PDC. As discussed before, this part took unexpected attention of preservice teachers. Therefore, taking newcomers interest to the PDC and sustain old comers interest, this part of the portal has to be kept updated. Content developers search new and interesting materials (lesson plans, lesson activity, cues, software or computer supported materials, etc) to be able to compose a knowledge based for community members on the PDC portal. Furthermore, they can be responsible to transmit important points of the discussion list discussions to the library part owing to collaboration with discussion moderators. These people can be selected from teachers and academician since a collaborative effort of this people can be selected valued materials for community members. These people should be hired since this job is too complex to make voluntarily.

Digital video creation team should be responsible to record videos from real classroom environments. Digital video creation has three main steps: 1) video recording from real classrooms 2) transforming video in digital format, analyzing them, and converting them into Internet videos. In the first step, they have to follow 13 steps, which were presented in the method section. Second step requires also experienced video developers since streaming of videos may cause viewing problem during discussions. These people should be also hired.

Technical support team should be a group of professional who are expert on specific field. Related to portal, they are to solve all technical problems and add new components to the portal. Therefore, this team should include both a programmer and graphic designer. Related to discussion list, technical support team should include community member for voluntary participation design. It is sufficient that these people become a component Internet user. The responsibility of this member is to support other members during discussion about some problems such as attaching a file to send the group, using and technical issues such as new member registration, changing message deliver type (individual e-mails, daily digest or special notices). All community members should know and apply to this person when they lived a technical problem in discussion list.

5.5. Suggestions for future research studies

This study provides a foundation for future researchers who want to study on web supported communities. Conducted research studies in this area revealed that there was promising evidences to use web based / supported communities in teacher education (Hawkes & Romiszowski, 2001; Barnet, 2002; Wang & Hartley, 2003; Sumsion, Patterson, 2004; Khan, 2005; Davis & Roblyer, 2005; Sprague, 2006; Levin, He & Robbins, 2006; Barnet, 2006; Lock, 2006; Simpson, 2006). Similar to this result, this study revealed that two cases have a valued potential to be used in teacher education. Therefore, rather than investigating experimentally the effect of web based communities in teacher education, this area need more dept studies such as following:

- The activity theory framework provided a good theoretical lens to evaluate and compare two cases in a whole with their design and implementation process. Therefore, other researchers may also use this theory to compose a baseline for their studies.
- This study did not interest to reveal conclusive evidence that preservice teachers' professional knowledge enhanced. Rather, dynamics of two cases was determined. However, apparent themes need to be quantified. Therefore, an experimental research design which aims to investigate more quantitative results of this study will allow the compare the two cases to reach an ultimate result. In other words, replication of this study with a survey which composes from the themes of this study will be valuable.
- As stated in Chapter 1, educators proposed to investigate what would do preservice teachers after a mandatory undergraduate course was concluded. This study was also interested in this topic and the participants in mandatory participation term had also participated to Phase 3. As a different research design, if the participants participated voluntarily in the Phase 2, what would have been the results of the study? Therefore, an elective course can be offered and volunteers can be called to the PDC to discuss. The results and dynamics may be different.
- In addition, in another study a taxonomy which allows the measure value of comments can be developed to reveal to the richness of comments in web based/ supported discussions. Owing to this taxonomy, researchers and educators can evaluate their web/based supported teaching.

- This study revealed some benefits of using video cases in web supported teacher education. In addition, the researcher concluded the importance of the content of video cases. The design of video cases was also promising to investigate. Which video case would be more successful to enhance teachers' tacit knowledge? Good examples, authentic classrooms, novices experiences, or else? In other words, to use in web supported learning environment, we need true video cases and we do not know which one will be more effective.

- In this study, both video cases and other preservice /experienced teachers' ideas had let the participants gain new ideas. Therefore, the field needs to know which one will be more effective and their advantages or problems in web supported teacher education as more detail.

- Furthermore, this study was limited by the perspectives of preservice teachers. In voluntary participation term, the opinions of other community members in the discussion list will be beneficial to evaluate complete dynamics of this voluntary discussion list discussion. There were some other discussion list whose members are teachers, academicians and so on. The researchers may investigate the dynamics of discussion list by comparing two or more discussion list. Such a comparative study will reveal general barriers and positive reinforcements in online communities which their members participated voluntarily. This result lets designers have a chance of design similar discussion environments.

As a conclusion, research studies on online communities of practice still need to be investigated. As I proposed above, there are more studies on this area. I hope these finding will be a base for researchers and designers and educators who want to use web supported environments and online communities in their studies.

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APPENDIX

A. PERMISSION FROM MINISTRY OF NATIONAL EDUCATION

EĞİTİM FAKÜLTESİ DEKANLIĞI
Ev Arş. Md. Saat :

T.C.
ANKARA VALİLİĞİ
Milli Eğitim Müdürlüğü

BÖLÜM : Kültür
SAYI : B 08 4 MEM 4 06 00 11-070/ 1066-3351
KONU : Video Çekimi

21.03.2005

ORTA DOĞU TEKNİK ÜNİVERSİTESİ REKTÖRLÜĞÜNE
(EĞİTİM FAKÜLTESİ)

Fakülteniz, Bilgisayar ve Öğretim Teknolojileri Eğitim Ana Bilim Dalı doktora öğrencilerinden **Bahar BARAN**'ın, ekli yazıda isimleri belirtilen İlimizdeki İlköğretim Okullarında doktora tezi araştırma projesi kapsamında sınıf içi video çekimi yapabilmesinin uygun görüldüğüne ilişkin Bakanlığımız, İlköğretim Genel Müdürlüğü'nün 17.03.2005 tarih ve 2831 sayılı yazısı ekte gönderilmiştir.

Bilgilerinizi rica ederim.

Erol ORTAKAYA
Valiye
Milli Eğitim Müdür Yardımcısı

EKİ:1- Bakanlık Emri

25.03.05 004077

BÖTE Bölümüne iletelim 29/3/05 sy

DANIŞMA 444 0 632 HATTI

Milli Eğitim Müdürlüğü Kültür Bölümü
06500- Beşevler/ANKARA
212 46 42 - 413 37 04- 212 66 40/184 Fax: 0 (312) 212 78 20

ankarumem@meb.gov.tr

kultur06@meb.gov.tr

T.C.
MİLLÎ EĞİTİM BAKANLIĞI
İlköğretim Genel Müdürlüğü

Sayı : B.08.0.İGM.0.08.04.02.531/
Konu : Video Çekimi

17.03.05 2831

ANKARA VALİLİĞİNE
(İl Millî Eğitim Müdürlüğü)

Ortadoğu Teknik Üniversitesi Eğitim Fakültesi Bilgisayar ve Öğretim Teknolojileri Eğitimi anabilim dalı doktora öğrencilerinden Bahar BARAN aşağıda isimleri belirtilen ilköğretim okullarında doktora tezi araştırma projesi kapsamında sınıf içi video çekimi yapmak istemektedir.

Söz konusu okul öğrencisi Bahar BARAN'a doktora tezi araştırma projesi kapsamında aşağıda isimleri belirtilen okullarda sınıf içi video çekimi yapması Genel Müdürlüğümüzce uygun görülmekte olup, bu konuda ilgiliye gerekli kolaylığın ve yardımın sağlanmasını rica ederim.

Selahattin ŞAHİN
Bakan a.
Genel Müdür Yardımcısı V.

DAĞITIM:
Gereği :
Ankara Valiliğine

Bilgi :
Ortadoğu Teknik Üniversitesi
Eğitim Fakültesi

Video Çekimi Yapılacak İlköğretim Okulları:
1- Çankaya Turhan Feyzioğlu İlköğretim Okulu
2- Çankaya Öğretmen Necla Kızılbağ İlköğretim Okulu
3- Mamak Batuhan İlköğretim Okulu

Gelen Evrakın Tarihi ve Sayısı 17.03.2005 708
Evrakın Gittiği Bölüm

369
17.03.2005

EĞİTİME %100 DESTEK DANIŞMA 444 0 632 HATTI
Atatürk Bulvarı 06648 Bakanlıklar/ANKARA Bilgi için:Ö.GÜNAYDIN
Telefon: (0 312) 413 16 10 Faks: (0 312) 417 71 05
e-posta:iogm@meb.gov.tr İnt. Adresi : www.meb.gov.tr

B. SYLLABUS OF THE PHASE I

Mesleki Gelişim Çemberi (MGÇ)

..Matematik Eğitimi Buluşma Noktası..

Mesleki Gelisim Çemberi (MGÇ) özellikle öğretmenler arasında uygulamaya yönelik bilgi paylaşımını içeren bir topluluktur. Bu topluluk, 2005-2006 öğretim yılında 3 üniversitenin ilköğretim matematik öğretimi ve sınıf öğretmenliği öğrencilerini bilgi paylaşımı için bir araya getirmeyi amaçlamaktadır. Bu doğrultuda belirlenen 3 üniversite aşağıdaki şekildedir.

 Ankara Üniversitesi, Sınıf Öğretmenliği,

 Ortadoğu Teknik Üniversitesi, İlköğretim Matematik Öğretmenliği,

 Çanakkale 18 Mart Üniversitesi, Sınıf Öğretmenliği.

Bu üç üniversitenin birlikte katılacağı ortak paylaşım alanında, öğrencilerin birbirleriyle ve dersi veren akademisyenlerle uygulamada karşılaşılan konuları sanal ortamda tartışarak, eleştirel düşünme yeteneği kazanmaları amaçlanmaktadır. Bu doğrultuda hazırlanan portal adresi ve iletişim bilgileri şu şekildedir;

Portal sayfasına ulaşım : http://mgc.metu.edu

e-liste : matematik_ogretiyorum@yahoogroups.com

Dönem boyunca yaşadığınız problemleri veya sorularınızı aşağıdaki iletişim bilgileri ile iletebilirsiniz. E-posta göndermeniz durumunda en geç 24 saat içerisinde size cevap gelecektir.

Bahar BARAN
MGÇ Yöneticisi
e-posta: XXX@metu.edu.tr
Tel: XXX
Adres: ODTÜ Eğitim Fakültesi Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü Z-13 06531 ODTÜ/ANKARA

1. HAFTALIK DERS PLANI

2005-2006 sonbahar dönemi boyunca MGÇ uygulaması 6 dönem olarak belirlenmiştir. 1. dönem tanışma amaçlı mesajlaşmayı içerirken geri kalan 5 dönem video izleme ve tartışma amaçlıdır.

Hangi üniversitenin öğrencilerinin görevinin ne olduğu döneme ait haftada yazılmıştır. Örneğin; 2. dönemde Ankara üniversitesi öğrencileri video ile ilgili yorumlarını yazarken, Çanakkale 18 mart üniversitesi öğrencileri yazılan yorumların doğruluğunu kontrol edecekler ve eklemek istedikleri düşüncelerini ekleyeceklerdir. Son olarak Orta Doğu Teknik üniversitesi öğrencileri önceki yorumları toparlayarak konu ile ilgili 1 adet ders planları önereceklerdir.

Her dönem 3 bölüme ayrılmıştır. Farklı üniversite öğrencileri aynı zamanda e-posta göndermeyeceklerdir. Aşağıda dönemler başlığı altında belirtilen tarihlerde ilgili üniversite öğrencileri belirtilmiştir.

2. ÖĞRENCİ SORUMLULUKLARI

A. Video İzlemek

- Döneme ait video ayrıntılı bir şekilde izlenmelidir.
- Video yu izlemeden önce ders planının okunması dersin anlaşılmasını kolaylaştıracaktır.
- Video yu izlerken dikkatinizi çeken hususları not alın.
- Videoları grup olarak tartışarak izleyebilirsiniz.
- Video izlenirken dikkat edilecek konular şunlardır;
    - Ders konusu ve konu içerisindeki aktiviteler nelerdir?
    - Öğretmen öğrencileri nasıl yönlendirmektedir?
    - Aktivitelerdeki problemli yönler nelerdir?
    - Aktivitelerin iyi yönleri nelerdir?
    - İlgili aktivite sayesinde öğrencilerin hangi yetenekleri gelişir?
    - Eğer ilgili dersin öğretmeni siz olsaydınız aktiviteleri zenginleştirmek için başka neler yapardınız?
    - Bu konu ile ilgili arkadaşlarınıza sizin önereceğiniz ders planı nasıl olurdu?
    - Farzedinki sınıfınızda bir tane eğitilebilir özel öğrenci var. Bu durumda onu bu aktiviteye nasıl adapte ederdiniz?
    - Bu dersinölçmesi nasıl olmalıdır. Farklı öğrenme teoriler temelinde tartışılabilir.
    - ..vs

B. **TARTIŞMAK:** Video izlendikten ve gerekli notlar alındıktan sonra asıl amaç bunları diğer öğrencilerle paylaşmaktır. Bu doğrultuda aşağıdaki adımları izlemelisiniz.

- **discussion list** (matematik_ogretiyorum@yahoogroups.com) : Listeye üyelik sizin verdiğiniz e-posta adresleri ile olacaktır. Bu nedenle yahoo.com dan alınmış bir e-posta adresi tercih nedeni olmakla beraber en sık kullandığınız e-posta adresinizi verebilirsiniz.

  discussion list sizin yukarıda video u izlerken dikkat edeceğiniz hususlar üzerine yapacağınız tartışmaları göndereceğiniz posta adresidir. Buraya göndereceğiniz postalar bütün üniversite öğrencilere ulaşacaktır.

*süreç içerisinde, okullara gittiğiniz zaman karşılaşacağınız problemleri ya da kafanızdaki soruları bu ortamdan ya da web sitesinde Forum başlığı altında yazabilirsiniz.

Tartışma Kuralları

- Amaca uygun olarak yazmalısınız. Öğretmenlik mesleği dışı yazılar discussion list ' e gönderilmemelidir.
  (Süreç içerisinde, okullara gittiğiniz zaman karşılaşacağınız problemleri ya da kafanızdaki soruları da bu ortamdan arkadaşlarınızla paylaşabilirsiniz.)
- Topluluk üyelerine karşı kibar olun. Yazı veya soru içeriklerinin karşınızdaki insanları incitmesine izin vermeyin. Topluluk üyelerinden birisi ile aranızda bir problem olması durumunda yönetici ile iletişime geçmelisiniz.
- Mesajlarınızı göndermeden önce lütfen en az iki kez okuyun.
- Reklam, yılbaşı tebrik ve bayram tebrik mesajlarınızı kişilere özel gönderin.

Gönderilen Postaların İçerikleri

- Forumun ve discussion list nin resmi dili "***Türkçe***" dir. Bu nedenle mesleğiniz ile ilgili kullandığınız kavramların Türkçe olmasına özen göstermelisiniz.
- Her öğrenci discussion liste ye dönem başına **3 mesaj** olmak üzere en az **15 farklı posta** göndermek zorundadır. Bu postaların sürece yayılmış olması çok önemlidir. Son hafta 15 posta birden gönderilmesi kabul edilmeyecektir.
- E-listeye gönderdiğiniz postaların içeriklerinin konu ile ilgili olması gerekmektedir.
- E-listeye gönderdiğiniz her posta ayrıntılı ve anlaşılır olmalıdır. Lütfen "evet" "hayır" gibi kısa cevaplı cümlelerden sakının.
- E-listeye, mesleki değer barındırsa bile size ait yorum içermediği sürece internetten yapılan alıntıların gönderilmesi kabul edilmeyecektir. Örneğin; fıkralar, hikayeler, şiirler, haberler..

3. NOTLANDIRMA

Bu uygulamadan sizin notlarınıza yansıyacak bölüm toplamda dersi veren öğretim üyesi tarafından belirlenecektir. İki ayrı bölüm üzerinden dönem sonu notunuz hesaplanacaktır.

1. **Sürecin değerlendirilmesi :** Ortam içerisinde gerçekleştirilecek tartışmalara yaptığınız katkının derinliği ve entellektüel kalitesine bağlı olarak değerlendirilecektir.

2. **Tecrübelerinizi yansıtıcı bir yazı:**

DÖNEMLER	AKTİVİTELER
Dönem 1. 05 Ekim - 09 Ekim	**Tanışma** • e-postalarınızı discussion listeye eklenmesi o yöneticiden e-posta alamayan öğrenciler bu dönemde durumu yöneticiye wwwmgc@metu.edu.tr adresine e-posta göndererek bildirmelilerdir. • Tanışma postasının içeriği şu şekilde olacaktır; o Adınız/soyadınız o Hangi üniversite ve bölümdesiniz? o Okuduğunuz bölümü neden seçtiniz? o Mezuniyet sonrası hedefiniz nedir? o Ilgi alanlarınız nelerdir? o Eğer taranmiş resminiz var ise resminizi ekleyiniz.
Dönem 2. 10 Ekim - 16 Ekim - ODTÜ 17 Ekim - 23 Ekim - ÇOMÜ 24 Ekim - 30 Ekim – ANKARA	**Ahmet' in videosu izlenecek** Etkinlik ile ilgili yorumların yazılması. ODTÜ Yorumlara cevap olarak eleştirilerin ve ek düşüncelerin eklenmesi: ÇOMÜ Tartışmaların sentezlenmesi ve ders planı önerisi: ANKARA
31 Ekim - 06 Kasım Ramazan Bayramı nedeniyle TATİL	
Dönem 3. 08 Kasım -15 Kasım - Ankara&ODTÜ 16 Kasım - 20 Kasım - ÇOMÜ	**Ebru'nun videosu izlenecek** Etkinlik ile ilgili yorumların yazılması. ANKARA Yorumlara cevap olarak eleştirilerin ve ek düşüncelerin eklenmesi: ODTÜ Tartışmaların sentezlenmesi ve ders planı önerisi: ÇOMÜ
Dönem 4. 21 Kasım - 29 Kasım- ÇOMÜ& Ankara 30 Kasım - 04 Aralık – ODTÜ	**Tuğba'nın videosu izlenecek** Etkinlik ile ilgili yorumların yazılması. ÇOMÜ Yorumlara cevap olarak eleştirilerin ve ek düşüncelerin eklenmesi: ANKARA Tartışmaların sentezlenmesi ve ders planı önerisi: ODTÜ
Dönem 5. 05 Aralık-13 Aralık- ODTÜ & ÇOMU 14 Aralık - 18 Aralık – Ankara	**Demet'in videosu izlenecek** Etkinlik ile ilgili yorumların yazılması. ODTÜ Yorumlara cevap olarak eleştirilerin ve ek düşüncelerin eklenmesi: ÇOMÜ Tartışmaların sentezlenmesi ve ders planı önerisi: ANKARA

!!! Bir sonraki sayfada video izlerken ve tartışmaları yaparken dikkat edeceğiniz hususlar anlatılmaktadır. Lütfen 2 numaralı başlığı dikkatlice okuyunuz.

NOT: Önerilecek ders planının içeriği dönem başında öğrencilere e-posta yolu ile gönderilecektir.

C. LESSON PLANS OF THE VIDEOS

C.1. Ahmet's video

Hazırlayan	**Adile Yıldız**
Konu	Sayılar (doğal sayılarda çıkartma işlemi)
Süre	40 dk
Seviye	1. sınıf
İhtiyaçlar	Geniş bir sınıf alanı
Kazanımlar	Çıkartmanın ayırma, azaltma ve eksilme olduğunu belirtir. Bir doğal sayıdan kendisi çıkarıldığında "sıfır" elde edildiğini gösterir.
Beceriler	İletişim, akıl yürütme, oyun
Öğretim yöntemleri	

ETKİNLİKLER

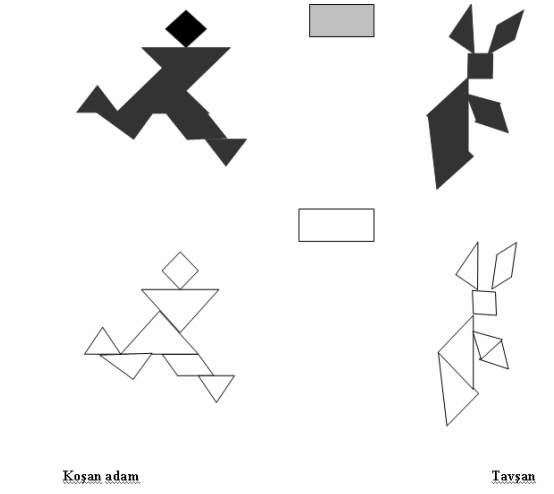
1. Bütün öğrenciler tahtaya çıkartılır ve el ele tutuşturularak çember oluşturmaları sağlanır. Öğrencilerden bir gönüllü seçilerek kurt olması istenir ve çemberin dışına alınır.
2. Çemberdeki öğrencilerden 8 tane kuzu seçilerek çemberin içine girmeleri istenir. Çemberi oluşturan öğrenciler kollarını ve bacaklarını kullanarak dışarıdaki kurdun içeri girip kuzuları yemesini engellemeye çalışırlar.
3. Kurt çemberin içine girdiğinde yakalayabildiği kadar kuzuyu alıp çemberin dışına çıkar. Öğretmen kurdun kaç tane kuzu yakaladığını ve içeride kaç kuzu kaldığını saydırır ve aynı şekilde oyuna devam edilir.
4. Her defasında içeride kalan kuzuların sayısı saydırılır ve içeride hiç kuzu kalmayana kadar oyuna devam edilir. Sonra kalan kuzularla 1-1, 2-2, 3-3 modelleri üzerinde durularak bir sayıdan kendisi çıkarıldığında sıfır elde edildiği vurgulanır.
5. Oyun farklı sayıda kuzu ve farklı bir kurt seçilerek yeniden oynatılır.

C.2. Ebru's video

Hazırlayan:	**Ebru Hırlak**
Konu:	Alan ölçüleri
Süre	40 dk
Seviye:	4. sınıf
Materyaller:	Tahtadan hazırlanmış tangram oluşturmak için gerekli geometrik şekiller (Kare, 2 büyük üçgen, 2 küçük üçgen,1 dik üçgen 1 paralelkenar) 1. (her gruba eşit ve yeterli sayıda verilecek şekilde), 2. Küçük kağıtlara siyah olarak hazırlanmış, geometrik şekillerden yapılmış şekiller (tavşan, koşan adam)
Kazanımlar:	• Geometrik şekillerin özelliklerini tekrarlar • Geometrik şekillerle diğer geometrik şekillerin nasıl oluştuğunu hatırlar • Bu geometrik şekillerle tangramlar oluşturur
Beceriler	Akıl yürütme, el becerilerinde bulunma

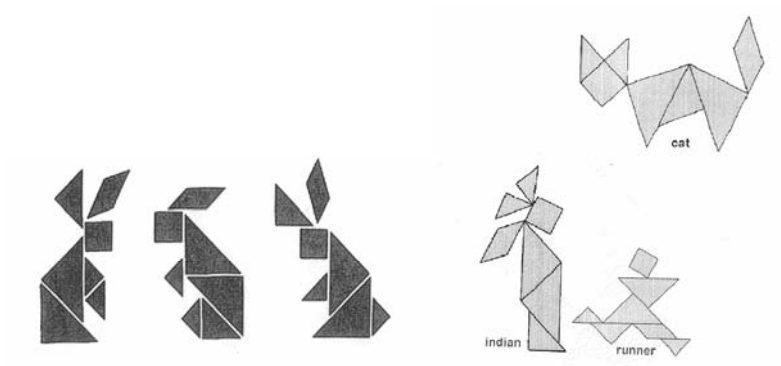
ETKİNLİK

- Öğrenciler 4-5 kişilik gruplara ayrılır
- Her gruba gerekli geometrik şekiller dağıtılır (yukarıda gösterilen şekilde)
- Bu geometrik şekillerin özellikleri hatırlanır
- Daha önceki bilgilere dayanılarak kare, paralelkenar gibi şekilleri ellerindeki diğer geometrik şekillerle oluşturmaları istenir (iki üçgenden bir kare gibi)
- Her gruba önceden kağıtlara hazırlanmış olan tangram şekilleri sırayla dağıtılır (siyaha boyanmış koşan adam, siyaha boyanmış tavşan- siyah renkli şekillern dağıtılmasının nedeni şekillerin hangi geometrik şekillerden oluştuğunun tam olarak ayırt edilememesi içindir)
- Dağıtılan şekilleri oluşturmaları istenir
- Ders sonunda ne yaptıkları açıklatılır ve dersin özeti yapılır
- Her öğrenciye yeni şekiller dağıtılır
- Her öğrenciye kağırttan hazırlanmış olan sınıftakilerle aynı geometrik şekiller dağıtılır ve dağıtılan şekilleri evde oluşturup defterlerine yapıştırmaları istenir.



Koşan adam Tavşan

DİĞER ETKİNLİKLER



C.3. Tugba's video

Hazırlayan	:Tuğba Eren
Konu	:Hacim ölçüleri
Süre	:40 dk
Seviye	:5. sınıf
Materyaller	:Renkli kartonlari makas, yapıştırıcı, cetvel, ahşap birim küpler
Kazanımlar	• Hacim ölçülerinden santimetre küpü milimetre küpe çevirir • Bir geometrik cismin hacmini standart olmayan bir birimle ölçer
Öğretim Metodu	:Öğretim metodu: keşfetme, soru-cevap, gösterme

Başlangıç:

Öğrencilere alan ve hacim kavramının ifade ettikleri, hacim ile alan arasındaki farklar, bir düzgün prizmanın hacmini hesaplarken cismin hangi kısımlarını kullanıldığı ile ilgili sorular sorulur. Daha sonra öğrencilerin görebileceği bir yere 3, 4 veya 5 birim küpü yan yana doğrusal bir şekilde dizilir. Öğrencilere bu şekil gösterilerek "bir kenarı 3 birim küpten oluşan küpün hacmi kaç birim küptür?" diye sorulur.

Ana etkinlik:

Öğrenciler 2'şerli ya da 4'erli gruplara ayrılır. Her gruba etkinlik kağıtları dağıtılırken, 122 cm'nin kaç mm olduğu sorulur (sorulacak sorular artırılabilir). Her gruba farklı uzunluklarda bir küp ve bir prizma dağıtılmadan önce etkinlik yönergeleri öğrencilere anlatılır. Öğrencilerden bir tanesinin yönergeleri tekrarlaması istenir.

Etkinlik yönergeleri:

- Her gruba bir prizma ve küpten oluşan iki geometrik şekil verilir.
- Etkinlik kağıdında geometrik şekil yazan yere geometrik şeklin adını yazmaları istenir.
- Daha sona bu geometrik şekillerin en, boy ve yüksekliklerini cetvelle ölçülmesi istenir.
- Verilen etkinlik kağıdındaki boluklara bunlar ilk önce cm cinsinden daha sonra milimetre cinsinden yazmaları istenir.
- İki cismin boyutlarını ölçtükten sonra her grup bir sonraki grupla geometrik cisimleri yer değiştirmesi istenir.
- Bunları da aynı şekilde ölçmeleri istenir.
- Öğrenciler istenen ölçümleri bitirdikten sonra ilk geometrik şeklin santimetre cinsinden hacmini hesaplamaları ve tabloda boş olan kısıma yazmaları istenir (hacmin biriminin ne olduğu sorulur)
- Daha sonra aynı cismin öğrencinin topladığı verilerle milimetre cinsinden hacmini hesaplamaları istenir.

- Aynı işlemleri diğer üç geometrik şeklin hacimlerini bulmak için uygulanması istenir.

Etkinliğin bu kısmında öğrencilere aynı geometrik cismin hacimlerinde santimetre ve milimetre küp cinsinden karşılaştırmaları istenir. Neden aralarında 1000 kartlık bir artış olduğu sorulur.

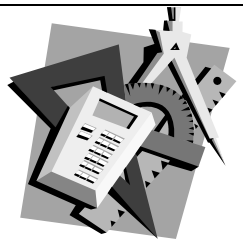
Bitiriş:

Daha sonra tablodaki 5. geometrik şeklin ölçüleri santimetre cinsinden öğrencilere söylenir. Hacmi santimetre cinsinden hesaplamaları istenir. Ama bu sefer kenarları milimetre ye çevirmeden doğrudan santimetre küpden hesaplamaları istenir.

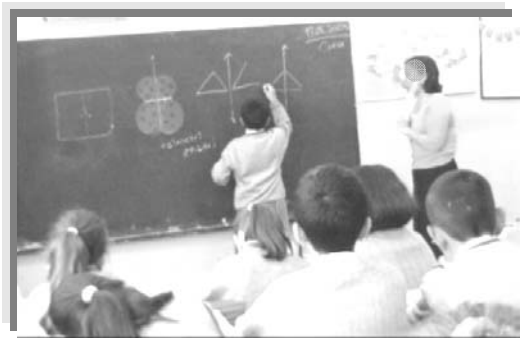
Eğer $1m^3$ 'ü cm^3 'e çevirmek istersek sonucunun ne olabileceği sorulur.

Bir öğrenciden etkinlik sonunda bir genelleme yapması istenir.

Değerlendirme: Konuyla ilgili alıştırma soruları verilir. Öğrencilerden çözmeleri istenir.

		**Kenar uzunluğu (Boy)**	**Kenar uzunluğu (En)**	**Kenar uzunluğu (Yükseklik)**	
1. Geometrik şekil	Santimetre (cm)				
	Milimetre (mm)				
2. Geometrik şekil	(cm)				
	(mm)				
3. Geometrik şekil	(cm)				
	(mm)				
4. Geometrik şekil	(cm)				
	(mm)				
5. Geometrik şekil	(cm)				
	(mm)				

C.4. Demet's video



Hazırlayan	:Demet Durmuş
Konu	:Simetri
Süre	:40 dk
Seviye	:5. Sınıf
Materyaller	• Simetriyi göstermek için kesilmiş kelebek • Simetri aynası • Tahtadan kesilmiş şekiller (Üçgen, kare) • Simetriyi göstermek için simetri kağıdına çizilmiş şekiller
Kazanımlar	• Simetriyi tanımlar. • Simetri aynasını kullanarak oluşan şekilleri çizer. • Simetrik şekillerin simetri eksenini belirleyerek eksik bırakılan simetrik parçayı tamamlar.
Öğrenme Metodları:	Soru-cevap yöntemi, grup çalışması yöntemi, gösteri yöntemi

ETKİNLİKLER

Başlangıç

- Ders başlamadan öce geçen ders ne yaptıkları sorulur.
- Bir önceki derste örüntüler işlenmiştir. Kısaca konun özeti yaptırılır.
- Özet yaptırıldıktan sonra yeni bir konuya geçileceği söylenir.
- Simetri konusunun işleneceği söylenir.

Gelişme

- Simetri kelimesini duyup duymadıkları sorulur.
- Simetriyi kavratabilmek için kelebek örneği verilir.
- Kelebek şekli çizilip kesilmiştir. Kelebeğin kanatları üstüste getirilerek aynı kanatlara sahip oldukları gösterilir.
- Kelebek üzerinde, kelebeğin tam ortasından geçen bir çizgi çizilir ve bu doğrunun simetri ekseni olduğu söylenir.
- Simetri ekseni gösterilip kelebeğin herhangi bir yerinden alınan noktayla simetri ekseninin diğer tarafında oluşan noktanın aynı uzaklıkta olduğu vurgulanır.
- Simetrinin tanımı verilir.

- Bu tanıma ve örneğe göre günlük hayattan örnekler verilmesi istenir. İnsanı ikiye ayırırsak bir simetri oluşturulacağı söylenir.
- Daha sonra bir etkinlik yapacakları söylenir.
- Öğrenciler gruplara ayrılır.
- Her gruba bir simetri aynası ve değişik şekiller verilir.
- Simetri aynasının ne işe yaradığı anlatılır. Simetri aynası aynı zamanda simetri ekseni olduğu vurgulanır.
- Verilen şekillerin nasıl göründüğüyle ilgili sorular sorulur.

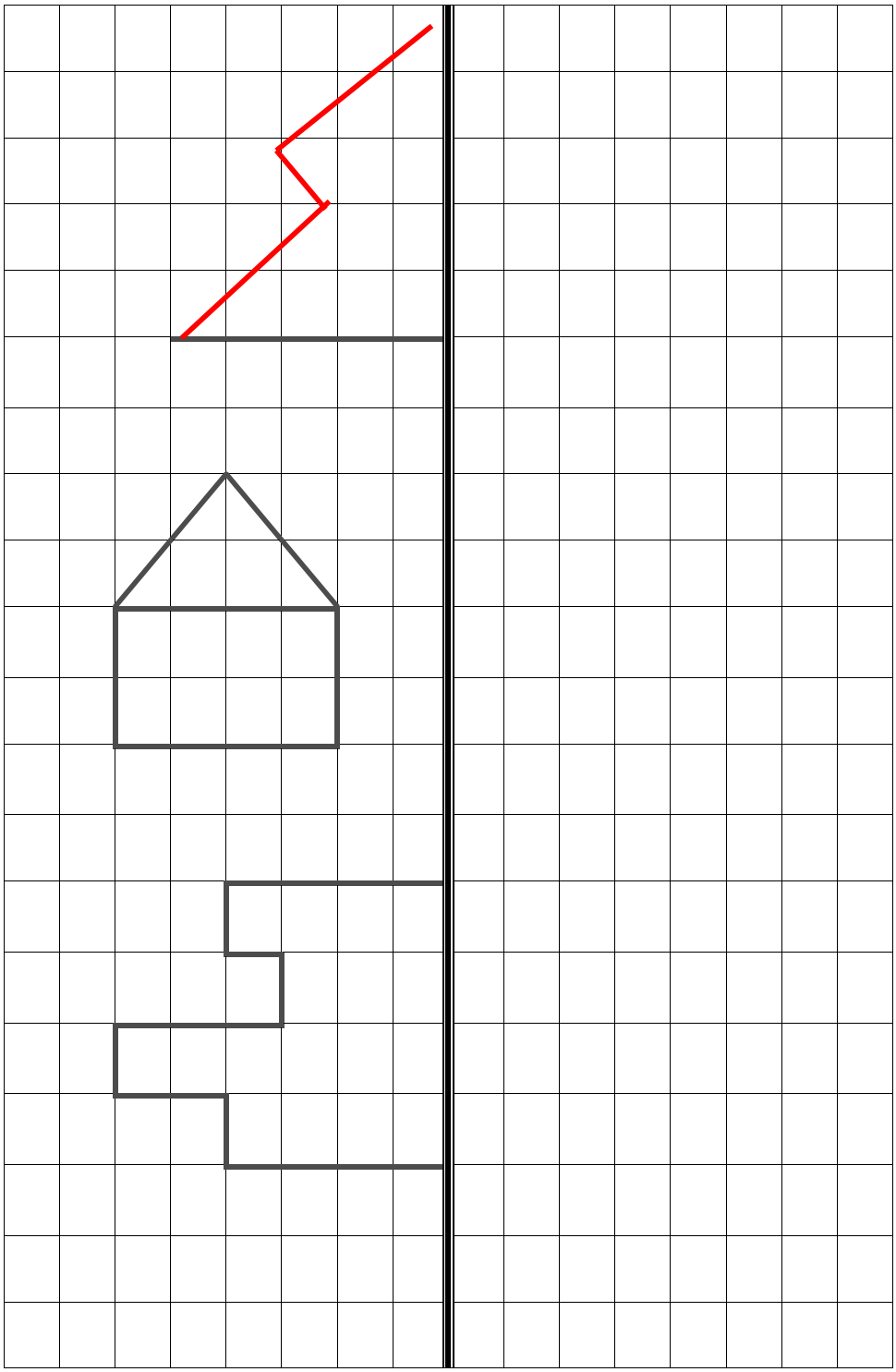
Örneğin:
Cisimleri nasıl görüyorsunuz? Şekillerin büyüklükleri değişti mi?

- Öğrencilerin simetri aynasında gördüğü şekilleri defterlerine çizmeleri istenir.
- Daha sonra alıştırma kağıdı dağıtılır.
- Bu alıştırma kağıdında, verilen şekillerin simetri eksenine göre simetrilerinin bulunmaları istenir.
- Alıştırmalar öğrenciler tarafından yapılır.
- Her alıştırmadan sonra bir öğrenci tahtaya şekli çizer ve nasıl yaptığını anlatır.

Sonuç
- Ders sonunda konu özeti yaptırılır.
- Öğrenciler simetrinin ne olduğunu öğrenirler.
- Eksenin duruşunun önemli olmadığı öğrenir.
- Hangi durumda olursa olsun simetri eksenine olan uzaklıkların eşit olduğunu öğrenir.
- Verilen bir şeklin herhangi bir eksene göre simetriğini çizer.

Değerlendirme
- Öğrencilerin günlük hayatta karşılaştıkları simetri örnekleri bulmaları istenir ve bunları defterlerine çizmeleri istenir.

SİMETRİKLERİNİ BUL!



D. DATA COLLECTION TOOLS

D.1. Survey about participants

MERHABA,
Bu araştırmanın amacı, 2005-2006 öğretim yılında okul deneyimi dersinde uygulanmaya başlanacak olan yeni uygulamanın etkiliğini değerlendirmektir. Anket formundaki bilgilerin düzgün olarak doldurulması uygulamanın değerlendirilmesi ve ilerleyen yıllarda daha etkili hale getirilebilmesi açısından önem taşımaktadır. Katılımınız için teşekkur ederim.

Bahar BARAN
Ortadoğu Teknik Üniversitesi
Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü

KİŞİSEL BİLGİLER

1. Adınız/soyadınız..... :
2. e-posta adresiniz..... :
3. Cinsiyetiniz? ..... : □ E □ K
4. Doğum Tarihiniz..... : 19_ _
5. Kayıtlı Olduğunuz Üniversite : □ Çanakkale 18 mart □ ODTÜ □ Ankara
6. Kayıtlı Olduğunuz Bölüm : □ İlköğretim matematik □ Sınıf öğretmenliği

İNTERNET KULLANIM BİLGİLERİ

1. Evinizde bir bilgisayarınız var mı? □ Evet □ Hayır (→4. soru)
2. Evinizde ki bilgisayarınızdan internete bağlanıyor musunuz? □ Evet (→4. soru) □ Hayır

3. Kendize ait ya da evinizdeki bilgisayarınızdan Internete bağlanmama nedenleriniz nelerdir?

Başka bir yerden bağlanıyorum	□ Evet □ Hayır
İnternet kullanmak istemiyorum (zararlı ya da faydalı olmadığına inanıyorum)	□ Evet □ Hayır
Abonelik ücretlerinin yüksek olması	□ Evet □ Hayır
Donanım maliyetinin yüksek olması	□ Evet □ Hayır
Kullanmasını yeterince bilmiyorum	□ Evet □ Hayır
İnternete bağlanmak için donanımım yok	□ Evet □ Hayır
Ailem izin vermiyor	□ Evet □ Hayır
Diğer	□ Evet □ Hayır

4. Evinizdeki bilgisayarınız dışında İnternet kullanıyor musunuz? □ Evet □ Hayır

6. Haftada kaç saat internet kullanmaktasınız?
□ 1 saatten daha az □ 6-20 saat
□ 1 - 5 saat arası □ 20 saatten fazla

7. İnternet'e erişimi en çok nerelerden sağlıyorsunuz?

** Sık kullandığınıza 1, en az kullandığınıza daha yüksek numara vererek sıraylayınız.*

___ Evden
___ Okuldan

___ İşyerinden

___ Yurttan

___ İnternet kafelerden

___ Arkadaşımın bilgisayarından

___ Diğer _____

8 Aşağıda verilen amaçlar doğrultusunda internetten faydalanma sıklığınız nedir?

	Hiç	**Çok Az**	**Az**	**Biraz**	**Oldukça**	**Çok Sık**
Ödev-araştırma yapma	□	□	□	□	□	□
Ödev- araştırma yapma amaçlı hangi sitelerden faydalanıyorsunuz.						
Eğitim alma (internet üzerinden sertifika veya diploma alma)	□	□	□	□	□	□
Eğitim alma amaçlı hangi sitelerden faydalanıyorsunuz?						
Tartışma grupları (Forum)	□	□	□	□	□	□
Hangi forum sitelerine bağlanıyorsunuz?						
discussion liste (yahoogroups vs)	□	□	□	□	□	□
Uye olduğunuz discussion liste isimleri nelerdir?						
İletişim (e- posta)	□	□	□	□	□	□
Sosyalleşme (chat)	□	□	□	□	□	□
Bilgi edinme (haber okuma, e-devlet uygulamaları (kimlik, vergi numarası)	□	□	□	□	□	□
Bankacılık – Alışveriş	□	□	□	□	□	□
Oyun – Eğlence	□	□	□	□	□	□
Diğer:.....	□	□	□	□	□	□

D.2. Reflection Report

En az 2 sayfa olacak.

23.12.2005 tarihine kadar

Word programına yazılarak wwwmgc@metu.edu.tr adresine e-mail olarak gönderilecektir.

Bu ödev ile ilgili olarak aşağıdaki soruları cevaplanacaktır. Önemli olan sizin samimi duygularınızı içermesidir. Ortamla ilgili düşüncelerinizin ilgili olumlu ya da olumsuz olması değerlendirmeyi etkilemeyecektir.

a. Öğretmenlik mesleği ile ilgili olarak meslektaşlarınızla aynı ortamları paylaşabileceğiniz dersler almak istermisiniz? Neden?
b. Mezun olduktan sonra böyle bir ortamda meslektaşlarınız ile mesleğiniz ile ilgili olarak haberleşmek ve bilgi alışverişinde bulunmak istermisiniz? Neden?
c. Diğer üniversite öğrencileri ile ilgili olarak
    i. Onlarla nasıl paylaşımlarda bulundunuz? Açıklayınız.
    ii. Onlarla iletişiminiz nasıldı? Açıklayınız.
    iii. Onların tartışmalarda yazdıkları fikir ve düşünceleri değerlendirir misiniz?
    iv. Diğer gruplardaki elemanların grup içerisindeki davranış ve hareketlerini değerlendir misiniz?
d. Ait olduğunuz grup ile ilgili olarak
    i. Grubunuzun etkililiğini değerlendirir misiniz?
    ii. Kendizi grupta nasıl bir eleman olarak görüyorsunuz? Lütfen kendinizi değerlendirin
    iii. Grubunuzun daha etkili olması için neler yapılabilirdi?
e. Kendi grubunuz ile diğer grupları karşılaştırır iseniz nasıl bir sonuca varıyorsunuz?
f. Daha önce aldığınız meslek öncesi dersler ile MGÇ deneyiminizi karşılaştırırsanız, bu ortamın sizin mesleki gelişiminize etkisi nasıl oldu?
g. MGÇ portalında eksik gördüğünüz konular nelerdir?
h. MGÇ portalının iyi yönleri nelerdir?
i. Bu deneyim sizde nasıl bir izlenim yarattı? Neden ? (pozitif, negatif, eğlenceli, yorucu..vs)
j. Bu tartışma platformunun daha etkili olması için neler yapılabilir?
k. Dönem boyunca, MGÇ ile ilgili karşılaştığınız teknik problemler nelerdi?

D.3. Interview schedule

MULAKAT SORULARI

Geçen dönem ile ilgili olarak;

1. Geçen dönemki deneyimizini nasıl değerlendiriyor sunuz?
3. Online ortamın yüzyüze deneyimlerinizden ne tür farklılıkları oldu?
    - Sınırlılıklar
    - Pozitif yanları
    - Genel bir değerlendirme yaparsanız online eğitimin hizmet öncesi eğitimde kullanılması hakkında ne düşünüyorsunuz?
4. Portalın biraz sonra okuyacağım bölümlerini tek tek değerlendirir misiniz?
    a. Kütüphane
    b. Videolarım: Videoların egitimde kullanilmasina nasıl bakıyorsunuz?
    c. Iletişim
    d. Forum
    e. En faydalı bölum sizce hangisidir? Neden?
5. Son bahar uygulamasında, grup içersinde kendinizi nasil bir kimlikte gördünüz?
    a. Örnek kimlikler, fenerbahçeli olma, izmirli olma..vs
    b. Bu toplulukta öğretmen olma kimliginiz ile üniversite kimliğinizi karşılaştırırsanız nasıl bir sonuca varıyor sunuz?
6. Ait olduğunuz universite ile ilgili olarak
    a. Grubunuzun etkililiğini genel olarak değerlendirir misiniz?
    b. Kendinizi grupta nasıl bir eleman olarak görüyorsunuz?
        i. Sessiz ise, onu sessiz kalmaya iten sebepler neledir?
        ii. Fazla mesaj atmis ise onu fazla mesaj atmaya iten sebepler nelerdir?
        iii. Daha aktif bir üye olmanizi sağlayacak etkenler nelerdir?
    c. Kendi grubunuzun daha etkili olması için neler yapılabilirdi?
    d. Kendi grubunuz içerisinde nasil bir iletişiminiz vardı?
7. Diğer grup öğrencileri ile ilgili olarak
    a. Onlarla nasıl paylaşımlarda bulundunuz?
    b. Onlarla iletişiminiz nasıldı?
    c. Diğer gruplardaki elemanların grup içerisindeki davranış ve hareketlerini değerlendir misiniz?
    d. Hala görüştüğünüz öğrenciler var mı?
        i. Var ise sizi onla görüşmeye iten sebepler nelerdir?
        ii. Görüşmüyor ise iletişimin kesilme sebepleri nelerdir?
        iii. Hiç görüşmemiş ise aklınıza geldi mi? Sizi engellen neydi?
    e. Tanımadığınız insanlardan sizin postalarınıza gelen düşünceler sizi nasıl etkiliyor?
8. Listeye posta gönderdikten sonra bir beklentiniz oluyor muydu? Nasıl?
9. Diyelim ki seneye bu dersi veren öğretim üyesi sizsiniz. Bu durumda ders planında nasıl bir değişiklik yapardınız?
10. Bu tür ortamların öğretmen eğitiminde kullanılabilirliği için düşünceleriniz nelerdir?

Bahar Dönemi ile ilgili olarak

1. Geçen dönem kapandıktan sonra portalda aktif oldunuz mu?
    a. Oldunuz ise sizi aktif olmaya iten sebep neydi?
    b. Olmamış ise neden buna ihtiyaç duymadınız?
2. Diğer arkadaşlarınızın durumunu değerlendirir misiniz?

3. Bahar döneminde tartışma listesine gelen postaların hepsini düzgün olarak takip ettiniz mi?
    a. Etmediyseniz
        1. Neden?
        2. Genel olarak insanlarin bu tur postalari takip etmeme sebepleri nelerdir?
    b. Ettiyseniz
        1. Sizi buna iten sebepler nelerdi?
        2. Insanların listeye gelen postaları takip etmelerine sebep olacak önemli sebepler neler olabilir?
4. Tartışmalar sırasında siz kendinizi nasil değerlendiriyor sunuz?
5. Bahar döneminde olusan bu yeni grup icersinde kendinizi grupta kim olarak görüyorsunuz?
6. Bahar döneminde portala gelen e-postaların sizin mesleki gelişiminiz için önemi nasıl?
7. Mgc' deki tartışmaların etkililiğini değerlendirir misiniz?
8. E-listelerde gözlemlediğiniz davranış tipleri sizce nelerdir?
9. Bu ortamda insan davranışları hakkında ne düşünüyorsunuz?
10. Bu ortamlarda ne tür insan tipleri gözlemlediniz?
11. Tartışmalar (sessiz kalanlar ile ilgili deneyimler)
    a. Onların tartışmaları takip ettiğini düşünüyor musunuz?
    b. Onları katılımcı olmaktan alıkoyan sebepler nelerdir?
    c. Bu grubu daha etkin kılmak için neler yapılmalıdır?
12. Tartışmalar (aktif üyeler)
    a. Bu gurubun aktif üyeleri kimler sizce?
    b. Kimlerin grupta daha aktif olduğunu düşünüyor sunuz?
    c. Kişileri aktif yapan özellikler nelerdir?
13. Hiç özel olarak posta gönderdiğiniz kişiler oldu mu?
    a. Buna neden gerek duydunuz?
    b. Onların size yaklaşımını değerlendirir misiniz?
14. Bu tartışma platformunun daha etkili olması için neler yapılabilir?
15. Son bahar dönemi ile bahar dönemini karşılaştırdığınız zaman nasıl bir sonuca varıyor sunuz?
    a. Öğrencilerden gelen postaların azalmasını nasıl değerlendiriyor sunuz?
        i. Bunu etkileyen sebepler nelerdir?
        ii. Postaları artırmak için neler yapılabilir?

CURRICULUM VITAE

PERSONAL INFORMATION

Surname, Name	**: Baran, Bahar**
Nationality	: Turkish (TC)
Date and Place of Birth	: 11 June 1977, Trabzon
Marital Status	: Married
Phone	: +90 312 210 36 73
Fax	: +90 312 210 22 91
e-mail	: baharoztekin@hotmail.com

EDUCATION

Degree	Institution	Year of graduation
MS	KTU Mathematic Education	1999
BS	KTU Statistics and Computer Sciences	1998
High School	Affan Kitapçıoğlu High School, Trabzon	1994

WORK EXPERIENCE

Year	Place	Enrollment
2002-	METU, Computer Education and Instructional Technology	Research Assistant
1999-2002	KTU, Secondary Science and Mathematics	Research Assistant
1999	ÇOMU, Computer Education and Instructional Technology	Research Assistant

FOREIGN LANGUAGES

English.

SELECTED PUBLICATIONS

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