TEACHER ENGAGEMENT
IN ONLINE PROFESSIONAL DEVELOPMENT FOLLOW-UP:
THE ROLE OF THE WORKPLACE AND ICT FAMILIARITY

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2017

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Thesis submitted to the

Institute for Graduate Studies in Social Sciences

in partial fulfillment of the requirements for the degree of

Master of Arts

in

Primary Education

by

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Boğaziçi University

2017

Teacher Engagement in Online Professional Development Follow-Up:

The Role of the Workplace and ICT Familiarity

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May 2017

DECLARATION OF ORIGINALITY

I, Canan Güneş, certify that

- I am the sole author of this thesis and that I have fully acknowledged and documented in my thesis all sources of ideas and words, including digital resources, which have been produced or published by another person or institution;
- this thesis contains no material that has been submitted or accepted for a degree or diploma in any other educational institution;
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ABSTRACT

Teacher Engagement in Online Professional Development Follow-Up:

The Role of the Workplace and ICT Familiarity

The aim of this study is to examine factors that affect primary school teachers' participation in an online forum that was set as a follow-up support platform of a professional development workshop about Information and Communication Technology (ICT) use in education. A purposeful sample of 89 primary school teachers participated. The study followed a sequential explanatory mixed design with a quantitative initial phase and a qualitative follow-up that allowed expansion and elaboration on the results of the quantitative phase. The quantitative phase was a prediction study that was conducted via logistic regression. The qualitative phase was a phenomenology conducted via content analysis of classroom observation notes and individual interviews that followed a hierarchical focusing method. Quantitative findings revealed that teachers' perceived workplace conditions and teachers' prior forum experience predicted online participation significantly, whereas teachers' attitudes towards ICT use in education, gender, work experience, and computer competence did not significantly predict online participation. The identified key themes that emerged from the data about teachers' perceptions of the factors that affect online participation were as follows: (a) teachers' need to use ICT applications introduced in the workshop, (b) teachers' reactions to ICT-related problems, (c) training for online forum use, (d) others' posts on the online forum, and (e) lack of time.

ÖZET

Öğretmenlerin Çevirimiçi Mesleki Gelişim Takip Platformuna Katılımları: Çalışma Şartları ile Bilişim ve İletişim Teknolojilerine Aşinalığın Rolü

Bu çalışmanın amacı ilkokul öğretmenlerinin çevrimiçi foruma katılımlarını etkileyen faktörleri incelemektir. Çevrimiçi forum, Bilişim ve İletişim Teknolojileri (BİT) ile ilgili bir mesleki gelişim seminerinin takip destek platformu olarak oluşturulmuştur. Çalışmaya amaçlı örneklemle belirlenen 89 sınıf öğretmeni katılmıştır. Çalışma nicel araştırmayla başlayıp nitel araştırmayla devam eden karma metodun keşfedici yaklaşımını takip etmiştir. Nicel araştırma lojistik regresyon analizi ile yapılan korelasyon araştırmasıdır. Nitel araştırma sınıf gözlemleri ve hiyerarşik odaklanma metodu ile yapılan bireysel mülakatların içerik analizine dayanan fenomenolojidir. Nicel bulgulara göre çevrimiçi foruma katılımı tahmin etmede, öğretmenlerin işyeri şartlarına yönelik algıları ve öğretmenlerin forum deneyimine sahip olmaları önemli ölçüde etkiliyken, öğretmenlerin eğitimde BİT kullanımına yönelik algıları, cinsiyetleri, iş deneyimleri ve bilgisayar becerilerinin önemli ölçüde etkili olmadığı bulunmuştur. Öğretmenlerin çevrimiçi katılımlarını etkileyen faktörlere yönelik algıları hakkındaki veriden ortaya çıkan belli başlı temalar şöyledir: (a) öğretmenlerin seminerde tanıtılan BİT uygulamalarını kullanma ihtiyaçları; (b) öğretmenlerin BİT ile ilgili yaşadıkları problemlere yönelik tepkileri; (c) çevrimiçi forum kullanımına yönelik eğitim; (d) diğer katılımcıların çevrimiçi forumdaki paylaşımları; ve (e) zamansızlık.

ACKNOWLEDGEMENTS

I would first like to thank my family for always supporting and encouraging me to fulfill my dreams. They always stand by me whenever I sink into pessimism and spur me to hold my dreams passionately again.

I also thank my thesis advisor, Assoc. Prof. Serkan Özel, at the Faculty of Education at Bogazici University. He helped me to maintain my motivation to grow my own ideas and to fulfill my research plan by consistently allowing this paper to be my own work, but steering me in the right direction whenever I needed direction.

I would also like to express my appreciation to Assist. Prof. Fatma Aslan Tutak (Boğaziçi University) and Assoc. Prof. M. Sencer Çorlu (Bahçeşehir University) for being on my dissertation committee and encouraging me with their invaluable praise to walk through the challenging roads of academia.

I would also like to acknowledge the teachers who participated in this study. They sacrificed their time to make this study come true. This study would not have been possible without their cooperation.

I am also thankful to all of my friends. They accompanied me in this journey with their love, laughter, brotherhood, and patience. Among my friends, I would like to thank Furkan Dodurga, Fatma Güneş Ertaş, and Kübra Fırat for giving me feedback on my thesis whenever I asked them. It is really comforting to have such knowledgeable and helpful friends as you.

Last but not least, I would like to thank my mother, Cemile Güneş, for transmitting her eternal love, which makes me feel safe and peaceful wherever I go.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDIX FIGURES

ABBREVIATIONS

CFA	Confirmatory Factor Analysis
EFA	Exploratory Factor Analysis
ICT	Information and Communication Technology
ICT-PD	Professional Development Programs in Information and Communication Technology Integration
Moodle	Modular Object Oriented Dynamic Learning Environment
PD	Professional Development
SASS	Schools and Staffing Surveys
TPCK	Technological Pedagogical Content Knowledg

CHAPTER 1

INTRODUCTION

As Information and Communication Technology (ICT) has entered our lives, it has started to have a place in our classrooms, too. In order to make use of ICT to its full capacity, teachers should learn how to integrate it into their lessons properly. Professional development (PD) programs have potential to develop teachers' knowledge, especially when follow-up activities of PD programs could support teachers' skills further. Online forums might be an alternative to face-to-face follow-up activities. This study investigates teachers' participation on an online forum which was set as a follow-up activity for a PD program about ICT in education.

1.1 Background of the study

Teaching requires a range of skills from classroom management to planning for good instruction. Another skill a teacher should have is to adapt their teaching to new educational policies. With recent research that shows the positive influence of ICT use in teaching, education systems started to emphasize the necessity of ICT integration into classrooms. However, the term *ICT integration in education* does not have a unique and extensive definition, and this results in varying use of the term (Lloyd, 2005). Despite multiple definitions to ICT integration in education, the aim stays the same: to help students to achieve the learning objectives (Usluel, Mumcu, & Demiraslan, 2007).

As learning goals differ, ways to integrate ICT in education vary as well (Reimann & Goodyear, 2003). There are three different uses of ICT in education: use of ICT as subject matter, use of ICT to improve teaching and learning, and use of

ICT to foster a knowledge society (Farrell & Wachholz, 2003). On the way to improve teaching and learning, Inan and Lowther (2010) distinguished three distinct use of ICT: “technology for instructional preparation, technology for instructional delivery, and technology as a learning tool” (p. 138).

It is problematic to conclude that ICT use improves student learning in general due to the lack of impact studies and limitations to generalizability, validity and reliability (Balanskat, Blamire, & Kefala, 2006). However, it does not mean that ICT fails to affect student learning. ICT might contribute varying student learning through selecting a suitable ICT tool and using it in a suitable way (Cox & Marshall, 2007). In order to assess the effect of ICT in education, it is suggested to examine how ICT affects teaching practices (Balanskat et al., 2006; Cox & Marshall, 2007; Crook, Harrison, Farrington-Flint, Tomas, & Underwood, 2010). ICT use has the potential to change classroom teaching and learning practices via responding to individual learning needs, extending and elaborating learning activities, integrating separate episodes of learning, and enhancing classroom participation, feedback provision, and pace of learning (Crook et al., 2010). However, Livingston (2012) claimed that ICT does not yield its transforming power, despite its potential.

There are several factors which inhibit innovative use of ICT in education (Afshari, Bakar, Luan, Samah, & Fooi, 2009; Andoh, 2012; Ertmer, 1999; Mumtaz, 2000). Those factors can be separated into two groups: manipulative factors and non-manipulative factors.

Manipulative factors include teachers’ computer experience (Inan & Lowther, 2010; Karaca, Can, & Yıldırım, 2013; Mumtaz, 2000), pedagogical approach (Chen, 2008; Drent & Meelissen, 2008; Lim, 2007), and attitude towards ICT (Drent & Meelissen, 2008; Inan & Lowther, 2010).

Non-manipulative factors include a vision of and a plan for the contribution of ICT to education (Ng, Miao, & Lee, 2009), access to the ICT infrastructure (Blignaut, Hinostroza, Els, & Brun, 2010; Ng, Miao, & Lee, 2009), teacher training (Blignaut, Hinostroza, Els, & Brun, 2010; Ng, Miao, & Lee, 2009), time for teachers to experiment, reflect, and interact with ICT tools (Afshari et al., 2009; Andoh, 2012; Franklin, 2005), leadership and technical support (Afshari et al., 2009; Andoh, 2012; Bauer & Kenton, 2005; Drent & Meelissen, 2008; Inan & Lowther, 2010, Pelgrum,2008), teachers' age (Inan & Lowther, 2010; Somekh, 2008), and teaching experience (Inan & Lowther, 2010; Tezci, 2009).

A sound ICT integration could be achieved by taking all of the aforementioned manipulative and non-manipulative factors into consideration. Even though teachers attribute their failure to integrate ICT in education to non-manipulative factors, this accusation might be related to manipulative factors such as teachers' beliefs (Ertmer, 1999). On the other hand, effective teacher training, which is a non-manipulative factor, has the potential to bring a change in manipulative factors such as computing competence and attitudes towards ICT in education (Mumtaz, 2000).

Effective PD programs have certain characteristics. They are related to content knowledge, based on active learning, coherent, long-lasting, and based on collective participation (Desimone, 2009). In ICT-related PD programs, the focus shifts from content knowledge to technological pedagogical content knowledge, as indicated by Mishra and Koehler (2006). While the aforementioned characteristics improve the effectiveness of PD programs, the lack of follow-up support in PD programs decreases the possibility that teachers will adapt the content of PD for use

in their school routine (Guskey, 1994; Ingvarson, Meiers, & Beavis, 2005; Richardson, 2003).

There are examples of face-to-face follow-up support initiatives (e.g., Atay, 2004; Cheng, 2013; Efaw, 2005; Kortecamp & Croninger, 1996; Waters, 2006). However, they have certain disadvantages: requirement of funding mentors, inadequate time for face-to-face meetings, and geographical distance between teachers and supporters (Cheng, 2013; Waters, 2006). Online platforms, especially online discussion forums, might constitute an alternative to face-to-face follow-up support activities. It is easy to meet people online, and forum members can support each other without the dominance of mentors (Fardoun, Mashat, & López, 2013; Green & Cifuentes, 2008; Riding, 2001; Yang & Liu, 2004). However, studies show that online forums do not guarantee the same participation patterns among teachers. Teachers' participation reflects variation in terms of the content (Riding, 2001), the function (Prestige, 2010), the direction (Moore, 1989), and the number of posted messages (Downer, Locasale-Crouch, Hamre, & Pianta, 2009; Riding, 2001; Stephens & Hartmann, 2004; Tsiotakis & Jimoyiannis, 2016).

Factors which affect variation in online participation can be separated into two groups: design-based factors and individual factors. Design-based factors include the topic of discussion (Owston, Wideman, Murphy, & Lupshenyuk, 2008; Riding, 2009; Tsiotakis & Jimoiyannis, 2016), facilitation (Owston et al., 2008; Riding, 2001; Tsotakis & Jimoyiannis, 2016; Yang and Liu, 2004), and a sense of community (Hur & Brush, 2009). Among individual factors, there exist teachers' availability of time (Yang & Liu, 2004), self-regulated learning skills (Chen, Chen, & Tasai 2009), and familiarity with forums (Tsiotakis & Jimoiyannis, 2016). To the researcher's best knowledge, apart from the aforementioned factors, studies which

examine the variation in teachers' online participation have not focused on the relationship between teacher commitment and online participation. There is a relationship between teacher commitment and teachers' attempts to develop their teaching (Firestone, 1996; Hopkins & Stern, 1996). Since teachers' participation in online follow-up forums might reflect an intent to adapt PD content to their teaching, teacher commitment might have a role in online participation, too. In this study, an online discussion forum was first set as a follow-up support activity for a PD workshop related to ICT in education. Then the relationship between teachers' online participation and teacher commitment was investigated.

This study aimed to examine the roles of teachers' perceived workplace conditions, teachers' demographics, and teachers' attitudes towards ICT in education on predicting teachers' online participation, and to identify how teachers perceive factors which affect their online participation. Coladarci (1992) suggested studying workplace conditions as one of the ways to measure teachers' commitment. In addition to workplace conditions, Day and Gu (2007) suggested that teachers' personal and professional conditions might influence teacher commitment. Therefore, both teachers' perceived workplace conditions and teachers' demographics were examined as important predictors of teacher commitment. Moreover, teachers' attitudes towards ICT in education were also examined because the PD workshop aimed at enhancing use of ICT tools in education, which is influenced by teachers' attitudes (Drent & Meelissen, 2008; Inan & Lowther, 2010).

1.2 Research purpose and research questions

The purpose of this study was to examine the longitudinal effects of the following groups of variables on teachers' online participation on a follow-up support activity

for a PD about ICT in education: (a) teachers' demographics, (b) teachers' perceived workplace conditions, and (c) teachers' attitudes toward ICT in education. Knowledge of the relative effects of those variables could guide future attempts to create online follow-up support platforms for PD workshops. Considering the aim of the study, research questions were the following:

Research Question 1: To what extent can teacher demographic, teacher perceived workplace conditions and teachers' attitudes to ICT integration in education predict teachers' participation in the online forum?

Research Question 2: How do teachers perceive the online forum?

Research Question 3: What do teachers think are the factors that affect their participation in the online forum?

1.3 Significance of the study

This study examined teachers' online participation on an online forum, which was set as a follow-up support platform for a PD workshop. Even though there are studies which investigate teachers' online participation in online forums, these forums were either a part of compulsory online courses in higher education institutions or they were a part of blended PD programs in which face-to face sessions went parallel with online sessions. In other words, research that attempts to investigate online forums as follow-up support activities for PD programs is rare.

This study seeks to identify factors which predict teachers' online participation on an online follow-up support forum for a PD workshop. Each of the factors being studied has been regarded as significant in online participation, but to the researcher's best knowledge, there is little research that attempts to investigate their predictive role. The results of this study will be able to contribute to the

literature related to the design and implementation of online forums as follow-up support platforms for PD workshops. Since there is a growing interest in and demands for PD workshops about integrating ICT in education, this study will provide information that may help PD staff to create effective strategies to support teacher learning after PD workshops by enhancing in-service teachers' participation in online forums.

1.4 Research design

This study employed a sequential explanatory mixed methods research design which included initial quantitative phase and following qualitative phase. Qualitative data were used primarily to explain quantitative data (Creswell, 2015).

Participants were 89 primary school teachers who enrolled in a PD program which was conducted with the partnership between a private school and Boğaziçi University. The PD program consisted of six workshops, and one of the workshop topics was related to ICT. The ICT workshops started in February 2016. During the ICT workshop, participants completed a demographics survey (Appendix A), a perceived workplace conditions scale (Appendix C), and attitudes towards ICT in education scale (Appendix E); the workshop instructor introduced the teachers to the online follow-up forum. After the ICT workshop, teachers were invited to the online forum, and their online participation was followed via log reports of the online forum until the end of May 2016. Direct logistic regression analysis was applied to analyze the quantitative data.

Six teachers were recruited for the qualitative phase of the study based on data from the aforementioned survey and scales. After the workshops, the researcher observed these six teachers in their classrooms. After May 2016, six individual

interviews were conducted to generate qualitative data. A hierarchical focusing method was used to conduct the interviews, and the interview protocol was developed and utilized to guide individual interviews with the teachers.

Observation notes and interview data were transcribed, and a content analysis was performed. Data were coded in two cycles. In the first cycle, the qualitative data was coded via in vivo coding. In the second cycle, axial coding was used in order to reassemble data which were separated at the first cycle of data coding.

1.5 Limitations of the study

The study has certain limitations. First of all, purposeful sampling and the use of self-reported measures for data collection endanger the generalizability of the results. In addition, online participation was determined according to the log reports of the online forum instead of the content analysis of the posted messages because there were few posted messages. Therefore, teachers' reasons for attending the online forum was unclear. Lastly, the time period for observation of online participation was three months, which might be a short period for an online community to evolve.

CHAPTER 2

LITERATURE REVIEW

2.1 ICT integration in education

Information and Communication Technology has been a hot topic in the field of education since the development of computer technologies in 1980s. All around the world, there are numerous studies about ICT integration in schools. Although the term *ICT integration* is uttered frequently, there is not a unique and extensive definition for it. Lloyd (2005) found in her review that the lack of a clear definition of ICT integration leads to multiple and contradicting uses of the term. For example, Inan and Lowther (2010) equated the term with technology use. Fluck (2003) described it as "the degree to which ICT vanishes into the background of the classroom learning activity" (p. 28) but did not specify explicitly what constituted the background of the classroom learning activity. Instead, Fluck (2003) signaled school climate, teacher expectations for student performance, and principle leadership as the most important elements to measure ICT integration. On the other hand, Lim (2007) claimed that use of ICT in each teaching and learning activity did not imply ICT integration. In his definition, ICT serves as an integral or mediated tool if a teaching and learning activity engages students in higher order thinking.

Although there are different definitions for ICT integration, they converge on a common point, which is the use of ICT as a tool to help students to achieve the learning objectives (Usluel et al., 2007). As learning goals differ, ICT is embedded in the education system differently (Reimann & Goodyear, 2004). Since the use of ICT in education varies to great extent, there is a need to classify it. Farrell and Wachholz (2003) separated the use of technology in Asian and Pacific countries into three

groups: the use of ICT as subject matter, the use of ICT to improve teaching and learning, and the use of ICT to foster a knowledge society. Among these categories, Inan and Lowther (2010) classified ICT use in teaching and learning into three groups: “technology for instructional preparation, technology for instructional delivery, and technology as a learning tool” (p. 138). It is the teacher who uses technology for instructional preparation. This kind of technology use serves for preparing lesson plans and materials to be used for instruction, searching for digital resources, and creating communication and collaboration with students, parents and colleagues. When technology is used for instructional delivery, both students and the teacher have direct contact with an ICT tool. For example, teachers present instruction through an interactive whiteboard, and students benefit from drill and practice software and digital simulations. ICT acts as a learning tool when students improve their problem-solving skills and productivity or exchange ideas with other pupils.

When it comes to assessing the impact of ICT on student learning, it is difficult to propose a general conclusion that ICT improves student learning. First of all, the number of impact studies is low. Moreover, findings of impact studies are problematic in terms of measurement and generalizability of the results (Balanskat, et al., 2006)

There are two main data sources in measuring the ICT effect on student attainment: exam or test results and teachers’ and students’ perceptions about the effect of ICT on student learning (Balanskat et al., 2006). However, these data sources present a handicap in terms of the validity and reliability of the results. First, measuring the effect of ICT via national exam results might endanger the validity. Cox et al. (2003) claimed that “researchers have often measured the ‘wrong’ things,

looking for improvements in traditional processes and knowledge instead of new reasoning and new knowledge which might emerge from the ICT use" (p.16). If the aim of ICT use is to increase students' test results, it is wise to measure the impact with national examination test results. However, if the goal is to enhance student learning such as improving problem-solving skills, then special measurement should be devised to assess the effect of ICT on these skills (Livingston, 2014). Secondly, measures that are based on self-reported questionnaires might call into question reliability by failing to demonstrate the actual impact of ICT on student learning (Balanskat et al., 2006).

There is a seemingly infinite number of educational ICT tools that are used in different ways in classes. Therefore, it is not correct to generalize the result of a specific ICT use to each educational context by suggesting that ICT improves learning. For example, Cox et al. (2003) emphasized this generalizability issue by claiming that student learning was enhanced via specific ICT use in specific subject matters such as simulations in science, modeling in mathematics, and word processing in English. In addition, they warned the reader that "this does not mean that all/or any ICT application has been shown to have this effect" (p. 43). Similarly, Livingstone (2012) indicated the interchangeable use of the word ICT in the literature and stated that this umbrella term makes it difficult to distinguish "which aspects of technologically-mediated learning, if any, are effective in any particular situation" (p.13).

Even if the results about the impact of ICT on student learning demonstrate methodological deficiencies, it is not correct to underestimate the effect of ICT in education (Balanskat et al., 2006; Cox et al., 2003; Livingston, 2012). The appropriate ICT tool, together with its effective use, might contribute to student

learning at various levels (Cox & Marshall, 2007). In other words, ICT may impact student learning through transforming teaching and learning activities. Therefore, examining impacts of affordances of ICT on teaching and learning activities might clearly demonstrate the effect of ICT in education. This approach brings teachers and their pedagogical approaches to the stage. That is, ICT tools can acquire a value in teachers' hands.

Several studies indicate that teaching practices are the second-most important area where the effectiveness of ICT might be examined (Balanskat et al., 2006; Cox et al., 2003; Crook, Harrison, Farrington-Flint, Tomas, & Underwood, 2010). Kozma (2003) found that students improved their collaboration, problem solving, and research skills when they used technology for collaborating with their peers, searching for information, and creating products; and teachers used technology for managing the course, planning instruction, monitoring student progress, searching for information, and collaborating with their peers. Similarly, Crook et al. (2010) found that new forms of classroom and learning practices might come into existence via ICT use (see Table 1). These practices created opportunities in four important areas that mediate student learning: responding individual learning needs; extending and elaborating learning activities; integrating separate episodes of learning; and enhancing classroom participation, feedback provision, and pace of learning. These studies show that ICT has the potential to enhance student learning via changing classroom practices.

Table 1. Consequences of ICT Use in Classrooms

Changes in Classroom Practice	Changes in Learning Practices
• The reconfiguration of space such that new patterns of mobility, flexible working, and activity management can occur • New ways in which class activities can be triggered, orchestrated, and monitored • New experiences associated with the virtualization of established and routine practices – such as using multiple documents in parallel or manipulating spatial representations.	• Exposition which is animated by the opportunity to invoke rich shared images, video, and plans • Independent research which is extended by the availability of Internet search opportunities • Construction which is made possible by ready-to-hand ICT-based tools.

Note. These lists were obtained from Crook et al. (2010, p. 4)

2.2 Factors affecting innovative educational ICT use

Technology has the potential to transform teaching and learning activities, but it is not used at full capacity (Livingston, 2014). Factors affecting teachers' innovative use of ICT tools were examined by a number of studies. Some researchers classified these factors into distinct groups. For example, Mumtaz (2000) indicated three main agents responsible for the ICT integration: the institution, resources, and the teacher. Similarly, Andoh (2012) attributed the success of ICT integration to personal, institutional, and technological characteristics. Ertmer (1999) divided these factors into two main categories: first order and second order barriers. First order barriers were extrinsic to teachers, such as access, training, and support, whereas second order barriers resulted from teachers' pedagogical approach. All of the aforementioned studies tried to separate these factors according to which body they belong. However, Afshari, Bakar, Luan, Samah, & Fooi, (2009) brought a new perspective to the categorization of these factors. They separated them into two groups according to the possibility of change they presented. Afshari et al. (2009) called them non-manipulative and manipulative factors. This categorization is more useful to work on because it focuses on whether a factor can be manipulated rather

than which actor it belongs to. Therefore, in the following section, factors affecting ICT integration are presented with regard to this kind of categorization.

Non-manipulative factors are the factors that teachers cannot have a direct influence on. Those are educational policies related to ICT integration, accessibility to the ICT infrastructure, teacher training, availability of time for teachers both to practice and to teach with ICT tools, leadership and technical support, teachers' age, and teaching experience.

Ng, Miao, and Lee (2009) listed key areas that policymakers should take into consideration for a sound ICT integration into education system. Those include determining the purpose of ICT integration, supplying the specific infrastructure that serves the purpose of ICT integration, development of content for ICT-supported teaching and learning, and training personnel for effective use of educational technology. Kozma (2008) added pedagogical and curricular change to these key areas and stated that components of the educational ICT policy should be aligned with its designated rationale to achieve its goal.

ICT tools do not deliver on their promises if the national policy disregards any of the above key areas. For example, Yusuf (2005) claimed that Nigerian educational policy focused on the importance of ICT integration in education, but it neglected the content development and PD aspects. As a result, he contended, the potential of ICT in improving teaching and learning stayed shadowed. Blignaut, Hinostroza, Els, and Brun (2010) found that even if the educational policies of Chile and South Africa reflected similar mission concerning the improvement of teaching and learning, Chilean teachers seemed to use ICT in education more than their South African colleagues. This gap was attributed to a difference in the amount of investment in infrastructure and teachers' PD in these countries. Thirty-two projects

were conducted between 1984 and 2013 in Turkey to integrate ICT in education (Topuz & Göktaş, 2015). Those projects aimed at developing ICT infrastructure and expanding the use of ICT by students and teachers. Among the 32 projects, only seven of them were devoted to PD. This unbalanced investment might be one of the reasons for low ICT use in classrooms.

Schools are identified as responsible agents for time and support-related factors. Schools might even prevent ICT integration if it increases teachers' workload (Afshari et al., 2009; Andoh, 2012; Franklin, 2005). On the other hand, a school might encourage ICT use if it provides teachers with support (Afshari et al., 2009; Andoh, 2012; Bauer & Kenton, 2005; Drent & Meelissen, 2008; Inan & Lowther, 2010, Pelgrum, 2008). Andoh (2012) separated school support into two groups: technical and leadership support. Technical support helps to maintain hardware and infrastructure in the school; leadership support includes implementation of technology plans and encouraging teachers to use technology in their lessons. Lim (2007) listed some leadership strategies related to successful ICT integration in Singapore's schools. Those were encouraging collaboration among teachers by scheduling meetings and implementing a buddy system. During the meetings, teachers communicated how they made use of ICT in their own classes. The buddy system coupled an experienced ICT practitioner with a novice. In addition, leaders created a shared ICT vision and integration plan so that school leaders and teachers coherently communicated about the effective use of ICT. Inan and Lowther (2010) found that school support had a significant influence on teacher beliefs, and it indirectly affected ICT integration via this influence. However, Drent and Meelissen (2008) found that school support affected ICT integration if teachers were inclined to make use of this support.

Teacher-dependent non-manipulative factors include years of teaching and age. There was a negative correlation between years of teaching and ICT use (Tezci, 2009). Similarly, Inan and Lowther (2010) found that years of teaching and age had a negative influence on ICT integration. Sheingold and Hadley (1990), on the other hand, found that experienced ICT users were the teachers who were older than 40.

Manipulative factors involve teachers as one of the change agent. These factors consist of teachers' computer experience, their pedagogical approach, and their attitude towards ICT.

Teachers with more computer experience use ICT more innovatively in their classes (Karaca, Can, & Yıldırım, 2013; Sheingold & Hadley, 1990). However, some teachers do not integrate ICT in their teaching even though they have computer competence (Bauer & Kenton, 2005; Demiraslan & Usluel, 2005). This might result from the difference between computer proficiency and didactic computer competence. Inan and Lowther (2010) defined computer proficiency as "teachers' perception of their own computer ability level" (p. 141), whereas they distinguished didactic ICT competence from computer proficiency as "teacher perception of their capabilities and skills required to integrate technology into their classroom instruction" (p. 141). Inan and Lowther (2010) found that computer proficiency affected ICT integration indirectly, whereas didactic ICT competence had a direct influence on ICT integration. Turkish primary school teachers also emphasized the importance of didactic ICT competence. They reported that they needed courses on technology and pedagogy in order to develop competency for integrating ICT into their teaching (Demir & Bozkurt, 2011).

Teacher's pedagogical knowledge is another factor affecting ICT integration. In Lim's (2007) study, teachers who integrated ICT successfully emphasized learner

autonomy and scaffolding strategies for the enhancement of engaged learning. Both learner autonomy and scaffolding strategies were indicators of student-centered pedagogical practices. However, Drent and Meelissen (2008) found that teachers' student-centered pedagogy had a direct but limited effect on innovative ICT integration. This was also evident in Chen's (2008) study: teachers stated that they did not use ICT due to educational policies, even though their perception about teaching and learning demonstrated a constructivist approach.

Attitude towards ICT has an influence on innovative ICT use. Inan and Lowther (2010) defined attitudes towards ICT in education as "Teachers' perception of technology's influence on student learning and achievement and impact on classroom instruction and learning activities" (p. 141) and found that it positively influenced ICT integration. On the other hand, the strength of this influence was very weak in Drent and Meelissen (2008).

Existence of one of the aforementioned factors does not guarantee a sound ICT integration. For example, teachers and headmasters indicated that lack of ICT infrastructure prevented ICT use in schools, according to the results of the Survey of Schools: ICT in Education (Wastiau et al., 2013). This survey was conducted in 2010 using a questionnaire distributed to 190,000 educators in schools in the 27 European Union countries, Croatia, Iceland, Norway and Turkey. The results showed that there was not a significant relationship between high levels of infrastructure and ICT use in classroom (Wastiau et al., 2013). Wastiau et al. (2013) found that teachers who had accessed ICT at school for a few years used it mostly for lesson planning and less (statistically several times a month) for working with students during lessons. According to Ertmer (1999), relative weights assigned to obstacles that are extrinsic to teachers may be related, at least in part, to barriers that are connected to the

teachers' pedagogical approach. However, effective teacher training which is extrinsic to teachers has an influence on teacher related factors such as computer competence and attitude towards ICT (Mumtaz, 2000).

2.3 Effective PD programs

PD programs do not always yield changes in teaching practice (Garet, Porter, Desimone, Birman, & Yoon, 2001). Various studies have proposed a range of factors that lead to successful implementation. Fullan (1992) claimed that PD programs should include ongoing activities instead of one-shot workshops. However, duration alone is not responsible for effectiveness of PD programs. In Matteson, Zientek, and Ozel (2013), teachers who participated a two-year PD program offered suggestions for the program to be more beneficial. Those teachers reported a need for more activities and materials appropriate for low-performing or cognitively impaired students, opportunities to explore technology-focused activities, more presentations about pedagogical uses of technology, and collaboration with their peers. Similarly, in addition to PD programs with a long duration, Garet et al. (2001) suggested PD programs that focused on content knowledge, engaged teachers in hands on activities were aligned with teachers' daily school routine, and emphasized collective participation of teachers from the same school, grade, or subject.

Desimone (2009) combined most common factors in the literature into a broad framework for studying the effects of PD on teachers and students. According to this framework, core features of effective PD programs consisted of content focus, active learning, coherence, duration, and collective participation. However, this framework did not include follow-up activities, another core feature that features prominently in the literature. Studies show that without follow-up activities, teachers

are less likely to apply their newly acquired knowledge and skills (Guskey, 1994; Ingvarson, Meiers, & Beavis, 2005; Richardson, 2003).

Effective PD programs in ICT integration (ICT-PD) also attribute their success to factors related to aforementioned core principles, except for content focus. PD programs in ICT integration were found to be successful when they emphasized technological knowledge and pedagogical knowledge instead of content knowledge (e.g., Browne & Ritcie, 1991; Granger, Morbey, Lotherington, Owston, & Wideman, 2002; Klieger, Ben-Hur, & Bar-Yossef, 2010; Littlejohn, 2002; Loveless, 2003). Technological knowledge includes certain IT skills, while pedagogical knowledge includes theories of learning. Apart from the combination of these two types of knowledge, Mishra and Koehler (2006) introduced technological pedagogical content knowledge (TPCK) as an important factor in integrating ICT in education. They maintain that teachers should combine their pedagogical knowledge and technological knowledge with content knowledge. Thus, they can make use of suitable technologies in helping students to learn certain subject matters that involve difficult concepts.

Regardless of the topic of a PD, successful ICT-PD programs follow activity-based learning. In activity-based ICT-PD programs, an activity type varies according to the aim of the program. Programs either had specific aims such as designing an online course (e.g., Littlejohn, 2002) or had more general objectives such as integrating ICT in classroom teaching and learning (e.g., Oner & Bumen, 2012). Mishra and Koehler (2006) gave examples of three different kinds of activities that were incorporated into master's-level courses on ICT integration. Those activities included designing idea-based videos to introduce important educational ideas, redesigning existing web page publishing for middle school course delivery, and

designing an online course. Instructors designed an online course in Littlejohn's (2002) study as well. In Oner and Bumen, (2012), teachers developed ICT-integrated lesson plans based on the skills and knowledge they had acquired during the PD.

Even though the activities reflected a variation among the ICT-PD programs, they were all conducted in a collaborative manner via small groups. Collaboration was maintained either through group discussions (e.g., Littlejohn, 2002) or group work (e.g., Oner & Bumen, 2012) or both (e.g., Mishra & Koehler, 2006). The main aim of collaboration was always exchanging ideas, and, as Prestridge (2010) stated, this would bring change in teachers. In the way of change, dialogue with others help teachers to "be convinced of the value of innovative educational practices and ICT integration" (Jacobsen, 2001, p.23).

PD activities bring change in ICT integration if they are aligned with teachers' local contexts and needs. MacDonald (2008) claimed that teachers' goals and the aim of PD programs should be parallel in order to foster self-reflection in teachers because successful ICT integration would be fulfilled through this self-reflection. In Littlejohn's (2002) study, teachers explicitly signaled this link between self-reflection and ICT integration by stating that writing reflective reports was a way towards change in their teaching and learning. In Littlejohn (2002), the PD program was developed after a needs analysis was conducted with the participants. According to this analysis, teachers needed to learn how to integrate dialogue and feedback in their online courses. Based on this need, the PD program focused on ways to bring dialogue and feedback to the online courses and asked teachers to evaluate their own designs in terms of dialogue and feedback.

Effective ICT-PD programs consisted of three phases: presentation, implementation and reflection (Afshari et al., 2009). In presentation, teachers are

introduced to the use of pedagogical technology in teaching, and then teachers are expected to practice those technologies in their own classrooms. The last phase gives teachers an opportunity to obtain feedback on their practice.

The timing of the presentation phase varies in the studies. In Oner and Bumen (2012), teachers were presented ICT skills first and then the pedagogy. Littlejohn (2002), however, suggested the opposite order and attributed the success of the PD program to this order because it shifted the focus towards pedagogy instead of technology. Mishra and Koehler (2006) did not present ICT skills at all and left the acquisition of required ICT skills to the teachers. Surprisingly, teachers acquired appropriate skills through collaborating with each other. However, this does not show that presentation of technological knowledge is unnecessary for PD programs in integrating ICT. Teachers explicitly demanded support for learning ICT skills (Littlejohn, 2002).

Providing teachers with sufficient guidance and support after PD programs is as important as supporting teachers during PD programs. Studies show that teachers need follow-up support to implement their newly acquired skills (Abuhmaid, 2011; Jacobsen, 2001; Uslu & Bumen, 2012). Some PD programs supply face-to-face follow-up opportunities for teachers (e.g., Atay, 2004; Cheng, 2013; Efaw, 2005; Kortecamp & Croninger, 1996; Waters, 2006). However, most teachers participate in PD workshops (Garet, Porter, Desimone, Birman, & Yoon, 2001) which most likely lack follow-up activities. This might result from the challenges associated with face-to-face follow-up (Cheng, 2013; Waters, 2006).

The main problems with face-to-face follow-up activities are the requirement to fund mentors, an inadequate time-interval for face-to-face meetings, and geographical distance between teachers and supporters. Teachers expected their

mentors to meet them frequently in a continuous manner for a sound follow-up (Abuhmaid, 2011; Waters, 2006). This brings about the necessity of a separate workforce in addition to the staff of PD program. In addition to funding, timing the follow-up activities is also problematic, as is the case of timing the training course itself. Teachers' complaints about their workload are ubiquitous in the literature. If follow-up activities are integrated into teachers' school routines, this would put extra pressure on teachers. If they are conducted after school hours, this would deprive teachers of their leisure time. Lastly, the location of follow-up activities should be considered carefully. Traveling long distances to participate in follow-up activities is both time-consuming and costly for teachers.

2.4 Affordances of online forums as an alternative to face-to face follow-up

It is easier to access information and to connect with other people via the Internet from anywhere at any time. Based on these affordances of the Internet, varying opportunities for teacher PD have appeared. Laferrière, Lamon, and Chan (2006) listed four different trends in the use of the Internet for teacher learning: online repositories or online courses, web-supported classrooms, learning communities, and knowledge building communities.

In online repositories, teachers can access educational materials and objects to use in their own classroom. Web-supported classrooms aim at improving teachers' practice via accessing exemplary cases. Those exemplary cases might be either video clips of other teachers' in the classroom or virtual visits and virtual practice. Online learning communities consist of teachers and a platform for sharing educational experiences and ideas. Similarly, knowledge-building communities involve teachers,

but the aim is not only sharing experiences but creating a knowledge base and educational design collaboratively.

These trends serve different needs. For example, delivery of information is useful when teachers are in need of educational materials, whereas learning communities are appropriate when teachers need to exchange ideas and reflect on educational practices. Among the aforementioned trends in Internet use for teacher learning, online learning communities seem to be more suitable for follow-up activities for PD programs.

The aim of follow-up activities is to supply teachers with continuing support after ICT-PD program finishes. Teachers might face some challenges in the real classroom when they apply what they learned from the PD. To overcome the challenges of novice practices, they need to communicate their experience and obtain feedback and advice about it. This obviously requires a platform where people exchange their ideas, as in the case of online learning communities. At this point, online forums can supply teachers with a place to meet and share their ideas.

Online forums are based on the asynchronous discussions of forum users. This feature brings several affordances for teachers to communicate. First of all, online forums set teachers free in terms of time and location. Forum users do not have to meet at a scheduled time interval at a certain place. In addition, teachers feel comfortable asking questions in online forums without fear of being ridiculed (Chen et al., 2009; Owston et al., 2008). Moreover, teachers find more opportunity to talk to their colleagues (King, 2002) and to get immediate feedback (Chen et al., 2009; Yang & Liu, 2004). Additionally, teachers might save time by contributing only to a specific forum topic. In online forums, teachers can obtain individual support appropriate to their prior knowledge and existing skills by focusing on the related

part of the discussions in online forums. For example, teachers with weak computing skills might communicate with their colleagues to strengthen these specific skills on one forum topic, while self-competent teachers are discussing how to integrate a certain ICT tool in their classes on another forum topic.

Online forums require mentors, as in the face-to-face follow-up activities. Creating online forums and expecting spontaneous collaboration among teachers is not realistic. One of the factors that leads to the creation of learning communities is facilitation (Owston et al., 2008; Riding, 2001; Tsotakis & Jimoyiannis, 2016; Yang and Liu, 2004). Therefore, an online forum should include a mentor to facilitate collaboration. However, mentors do not have to dominate the forum. In Chen et al. (2009), only 3.4% of the total messages were sent by the mentor of the platform. Even though the mentor may dominate the platform at the beginning, eventually some participants will voluntarily take on a leadership role (Farooq, Schank, Harris, Fusco, & Schlager, 2009; Prestige, 2002).

In online forums, instructor dependency can be decreased via a strong peer-to-peer dialogue (King, 2002). Diverse teachers with distinct expertise might act as mentors for others. According to Laferriere, Breuleux, and Erickson (2004, in Laferrie et al, 2006, p. 78), Internet-based technologies can bring teachers with distinct expertise together so that they can feed each other intellectually to create new insights into teaching and learning. Studies show that participants in a forum can supply online support for other community members by sharing their own experiences (Fardoun, Mashat, & López, 2013; Green & Cifuentes, 2008; Riding, 2001; Yang & Liu, 2004). Similarly, in Prestige's study (2010), it was found that online discussions held by teachers contribute to teachers' PD. Thus, interactions among participants may provide learning opportunities for follow-up activities, too.

All of the aforementioned affordances of online forum make it a potential place for follow-up activities. However, individuals' participation in online forums varies across studies. Some online forums may effective in creating discussions which lead to teacher learning, while others are ineffective in doing so. Even in successful online communities, there exist variations among the members in terms of contributions to the platform. Therefore, online forums do not guarantee a certain type of participation.

2.5 Variability in patterns of teacher participation in online forums

It is necessary to define online participation before discussing the variations in the participation patterns. Hranstinski (2009) distinguished two conceptualizations of online learner participation: low-level and high-level conceptualization. In a low-level conceptualization, the online participation is related to the frequency of a participant's access to the online platform or the number of messages read or written by a participant. Hranstinski (2009) criticized this approach as insufficient to conceptualize online participation. Instead, Hranstinski (2009) brought a high-level conceptualization to the term by defining it as "a process of learning by taking part and maintaining relations with others. It is a complex process comprising doing, communicating, thinking, feeling, and belonging, which occurs both online and offline" (p. 80). According to this perspective, the online participation can be observed either in the platform infrastructure or outside of it.

The analysis of the participants' actions on the platform might help determine online participation patterns to some extent. The messages posted can supply important data. There are a number of researchers presenting distinct analytical frameworks for the content analysis of the posted messages. Wever, Schellens,

Valcke, and Van Keer (2006) compared 15 frameworks in the literature and concluded that categorization of messages varies across studies. However, four main determinants of online participation pattern can be deduced from this review: content, function, direction, and quantity of the posted messages.

Electronic posts are separated into two categories based on their content. On-topic messages are related to the main topic of the discussion forum, whereas off-topic messages are not (Riding, 2001). For example, in Riding (2001), on-topic messages included issues such as classroom teaching, teaching resources, and exam-related issues, whereas off-topic messages were about technical problems with the platform and job adverts. This online community was created via an email list by the University of Cambridge Local Examination Syndicate as informal professional training. In Yang and Liu (2004), discussion topics focused on mathematical capacity. In their study, teachers were supplied with online workshops about mathematical capacity and asynchronous online discussions were integrated into the workshop program.

Posted messages function to create either social interaction or critical interaction. Social interaction messages provide emotional and technical support, change ideas as needed, and manage group activities. Social messages, especially those providing positive emotional feedback, are important in building relationships among the group members (Chen et al., 2009; Prestige, 2010). It is critical interaction messages that contribute teacher learning (Prestige, 2010). These messages are used for sharing information, perspectives, and experiences; assessing, linking, elaborating, and justifying ideas; reflection and scaffolding; negotiation of meaning; testing and modification of proposed synthesis or co-construction; brainstorming; questioning; offering solutions and strategies.

There is a relationship between content and the function of messages. While on-topic messages function in building critical interaction, off-topic messages encourage social interaction among members. The rate of postings which lead to critical discussion differs across studies. In Prestige (2010), it is generally low. Similarly, social interaction has more of a place in active online forums (e.g., Chen et al., 2009; Paulus, 2009). On the other hand, Yang and Liu (2004) presented an opposite scenario where on-topic messages constituted 96% of the messages. Similarly, in Koc, Peker, and Osmanoglu (2009), all of the messages posted on a discussion forum were related to the discussion topic.

When the critical discussion appears, teachers usually propose ideas or general advice (Yang & Liu, 2004). In addition, presenting problem situations and asking questions are also activities that prevail in discussions (Chen et al., 2009; Riding, 2001). Even though teachers' participation patterns in discussions follow a similar trend, a unique online community might demonstrate distinct participation patterns in time. For example, in Yang and Liu (2004), teachers posted messages in order to organize their thoughts or perspectives when the topic of the discussion was about a specific concept such as capacity mathematics. On the other hand, the same group of teachers posted in order to give general advice or to convey their ideas instead of building on others' posted messages when they were discussing a broad concept such as K-12 teaching.

Moore (1989) classified the direction of the participation in distance education as "learner-learner interaction, learner-instructor interaction, and learner-content interaction" (p. 19). In the learner-content interaction, information is transferred from the instructor to the learner via a specific media such as text or video. Similarly, an instructor plans and presents content to learners in learner-

instructor interaction. However, this type of interaction differs from learner-content interaction because it supplies learners with an opportunity to reflect on their comprehension so that the instructor can keep them on the desired route to learning. Lastly, learner-learner interaction creates a two-sided route to transmit information. In other words, both parties can contribute to the other's learning in learner-learner interaction.

Pawan, Paulus, Yalcin, and Chang (2003) showed that the pattern of posted messages varies from serial-monologues to collaboratively built professional knowledge. However, teachers generally demonstrated a one-way learner-learner interaction (Chen et al., 2009; Yang & Liu, 2004). In other words, participants generally do not reply directly to others' postings; they simply present their own ideas.

The studies about online learning communities demonstrate variability in participation rate as well. Some teachers contribute to discussions often, while others do not participate at all (Downer, Locasale-Crouch, Hamre, & Pianta, 2009; Riding, 2001; Stephens & Hartmann, 2004; Tsiotakis & Jimoyiannis, 2016). Tsiotakis and Jimoyiannis (2016) identified three distinct groups of teachers according to the amount of their individual contribution to the platform: active members, moderate members, and peripheral members. Active members start new discussions and contribute to the community discussions, participate in video conference sessions, and share their own creations, educational materials, and scenarios. Moderate groups take similar actions, but the number of these actions is not as high as those of active members. The peripheral members, which are also called "lurkers" in the literature, attend discussions but do not post anything. They read messages but do not contribute to the community by posting any messages.

In sum, teachers demonstrate variation in online platforms in terms of what they post, why they post, to whom they post, and how often they post. These differences in online participation patterns suggest the question of why teachers behave differently in the asynchronous communication.

2.6 Factors affecting participation in online forums

Studies that examine online asynchronous discussion groups of teachers indicated a number of factors that affect online participation. Those factors can be separated into two groups: design-based and individual factors. The discussion topic of the platform, facilitation of the participants, and building social bond among members are the most frequently mentioned factors in the studies. These are elements that are beyond the control of the participants. In other words, they stem from the design of the platform. On the other hand, there are some other factors that directly result from individuals. They include lack of time, forum habits, and the self-regulation skills of the community members.

2.6.1 Design-based factors

Online forums which are used as a PD activity exist in two different ways. Some are embedded in an online graduate course or PD program for teachers, or they are a separate informal PD platforms. According to the nature of the platform, design features vary. For example, if a platform is embedded in an online course, first of all it becomes a must to participate in the platform because it is one of the course requirements. Even if participation in the platform is set as requirement, this does not result in a learning community in which participants contribute to each other's learning by posting a high number of critical messages in an interactive manner.

Therefore, the design features will be explained without considering the platform type.

The discussion topic of forums is an important factor that affects the quantity of messages posted in online platforms. Researchers claim that discussion topics should reflect teachers' aims, needs, and interests for an active online participation in online forums (Owston et al., 2008; Riding, 2009; Tsiotakis & Jimoiyannis, 2016). Teachers are interested mostly in classroom teaching. For example, in Vonderwell and Zachariah (2005), teachers reported that if the content was irrelevant to their area of expertise, they stayed out of the online discussion. Since teachers are potential experts in classroom teaching and learning, they expect to communicate about their unique teaching situations (Hur & Brush, 2009). However, classroom teaching is not the only topic that can motivate teachers to communicate. Riding (2001) found that teachers actively contributed an email list which focused on a specific teacher examination. Therefore, it is not appropriate to suggest a specific topic for successful online discussions, but rather it is important to suggest a topic which meets teachers' expectations.

Online facilitation is another frequently cited factor that influences online participation (e.g., Owston et al., 2008; Riding, 2001; Tsotakis & Jimoyiannis, 2016; Yang & Liu, 2004). Yang and Liu (2004) claimed that when teachers find the facilitator helpful, they feel comfortable in the online forum, and this increases participation. Apart from the quantity of messages, their quality can also be changed by facilitator effect. In Chen et al. (2009), the function of teachers' messages shifted from sharing their experiences to demonstrating more cognitive skills in the discussion as the facilitator changed their questioning style.

Anderson, Liam, Garrison, and Archer (2001) defined facilitation as maintaining a learning community. They claimed that a facilitator achieves this goal by reading and responding participants' posts. Anderson et al. (2001) listed six different roles of a facilitator: "identifying areas of agreement/disagreement; seeking to reach consensus; encouraging, acknowledging, or reinforcing student contributions; setting climate for learning; drawing in participants, prompting discussions; and assessing the efficacy of the process" (p. 8).

Anderson et al. (2001) exemplified each role using certain questions and comments. For example, a facilitator may ask questions to identify areas of agreement/disagreement such as "Joe, Mary has provided a compelling counter example to your hypothesis. Would you care to respond?" (p. 8). This kind of facilitation might push participants to conduct an interactive discussion with their peers instead of sharing their experiences without referring to a prior post. The identified disagreement would reach a consensus with a facilitator comment such as "I think Joe and Mary are saying essentially the same thing" (p. 8).

In order to encourage and to reinforce students' contributions, a facilitator might post an acknowledgment message. This might increase the rate of online participation. For example, in Owston et al. (2008), teachers reported that when they did not receive a response to their post, this discouraged them from participating in the platform because they suspected their posts were not valued by anyone. Similarly, facilitators' questions such as, "Any thoughts on this issue?" (Anderson et. al., 2001, p. 8) can help to draw in participants and to prompt the discussion.

According to Anderson et al. (2001), another task of the facilitator is setting the climate for learning through comments such as, "Do not feel self-conscious about 'thinking out loud' on the forum. This is a place to try out ideas after all" (p. 8). This

kind of facilitation might encourage participants, especially the ones who are worried about the appropriateness of their answer. For example, in Vonderwell and Zachariah (2005), there existed teachers, although not many, who claimed that they did not post messages on the platform because they had difficulty articulating their ideas in writing.

Lastly, Anderson et al. (2001) exemplified the final task of the facilitator. They suggested that the facilitator assess the effectiveness of the process by posting comments such as, “I think we're getting a little off track here” (p. 8). This might trigger participants to post on-topic messages.

The number of participants and messages in online forums is also related to a sense of community. According to Hur and Brush (2009), a sense of camaraderie encourages continuous participation in online platforms. They found that teachers participated in online communities to share emotions and ideas. For these teachers, sharing emotions seemed to help them experience a sense of camaraderie.

Similarly, Tsiotakis and Jimoyiannis (2016) indicated a sense of community as an essential element of a learning community, which is rather different from a group of individuals. Rovai (2002) explained four dimensions of a sense of learner community: spirit, trust, interaction, and common expectation. Spirit referred to a sense of connectedness among participants of a learner community. Guan, Tregonning, and Keenan (2008) found that social bonding enhanced online participation. Trust referred to an expectation towards relying on other learners’ words and commitment to others’ learning. Rovai (2002) categorized interaction into two groups: task-driven interaction serves for completing assigned tasks, and socio-emotionally-driven interaction is related to relationships among learners. In social networks, reliable support is likely to appear via development of online and offline

relationships among community members (Tseng & Kuo, 2014). In Owston et al. (2008), face-to-face experiences were the glue that held teachers together as a community. The last dimension of a sense of learner community is a common expectation towards learning (Rovai, 2002). Learning as a united goal among members brings the feeling that participating in the community meets their educational needs.

In addition to explaining sense of community, Rovai (2002) listed ways to create it on online courses. One way is to increase dialogue among participants by making them aware that their contributions are graded. Enhancing social presence is another duty of a course instructor. Social presence in online platforms denotes "a complexion of reciprocal awareness by others of an individual and the individual's awareness of others" (Cutler, 1995, p. 18 in Rovai, 2002). Aragon (2003) suggested that posting welcome messages, including student profiles, incorporating audio, limiting class size, and structuring collaborative classroom activities on online platforms would help online participants be aware of others.

The third strategy of Rovai (2002) to create a sense of community is to set a warm tone in textual communications so that social equality to participate is maintained. This could be managed by encouraging community members to introduce themselves at the beginning of the online course in a separate discussion area. The fourth strategy is alignment of teaching style to the learning stage. Rovai (2002) exemplified this strategy with the following example: "The dependent learner is usually most comfortable in a learning environment that emphasizes structure over dialogue, while the opposite is true for the self-directed learner who seeks more dialogue and less structure" (p. 10).

2.6.2 Individual factors

In addition to design factors, some individual factors appear in the literature as responsible actors in online participation. Those are lack of time, ability to conduct a deep discussion, and self-regulation skills.

Teachers report lack of time as one of the barriers to online participation (Guan, Tregonning, & Kenaan, 2008). In Yang and Liu (2004), lack of time was related to a low number of posted messages. Teachers reported that more time is necessary for managing and understanding information about PD programs, assimilating materials, working on their projects, and communicating with their colleagues. Owsten et al. (2008) examined three online PD communities and found that teachers' lack of time to participate was one of the common reasons for failure in maintaining a sustainable online community.

Teachers having no prior experience in online platforms reported easy follow of community workflow which consisted of certain phases for teachers to pass through to create an online community. However, they indicated their lack of experience as a barrier to contributing to the discussions (Tsiotakis & Jimoiyannis, 2016). Similarly, Yang and Liu (2004) found that majority of teachers' posts in asynchronous discussions were one-way monologues. Yang and Liu (2004) attributed lack of interaction among teachers to an inability to conduct wide-ranging deep discussions and suggested scaffolding. Koç, Peker, and Osmanoglu (2009) verified Yang and Liu's (2004) suggestion by attributing the success of online discussion in their study to the anchored structure of the forum. Koç et al. (2009) asked student teachers to relate their discussions to a classroom video case which was posted on the forum. Classroom videos, together with the instructor's prompts, constituted the anchor for the discussion. Prestige (2010) claimed that gaining

experience in an online environment diminishes the need for support in developing understanding about the platform.

Self-regulated learning is another individual factor affecting online participation. Online learning requires learners to be self-monitored and responsible for their learning (Chen et al., 2009). Online discussions depend on teachers' willingness to take responsibility for their own self-development and on their being open to criticism in a challenging and supportive context (Yang & Liu, 2004).

2.7 Teacher commitment

The aforementioned individual and design-based factors in explaining the variability in the rate of online participation are treated in the literature. Apart from these factors, variability in teachers' tendencies to improve their teaching might be a factor that affects participation patterns in online learning communities.

Firestone (1996) and Hopkins and Stern (1996) stated that teacher commitment is related to teachers' attempts to develop their teaching. Some studies have examined the effect of teacher commitment on ICT integration. To the best knowledge of the researcher, there is no study that examines the relationship between teacher commitment and teachers' participation in online learning communities. Since the aim of the online forum is to create a platform for teachers to continue their PD, contribution to the forum might indicate teachers' attempts to improve their teaching. Thus, teacher commitment might affect teachers' participation in online forums.

Teachers demonstrate three different kinds of commitment. One of them is organizational commitment, whose definition was adapted from Mowday, Steers, and Porter (1979) as the relative strength of a teacher's identification with and

involvement in a school. Coladarci (1992) distinguished teaching commitment from organizational commitment, and he defined it as an "indicator of a teacher's psychological attachment to the teaching profession" (p. 323). Lastly, commitment to student learning was defined by Kushman (1992) as "teacher dedication to helping students learn regardless of their academic difficulties and social background". Nir (2002) stated that the aforementioned commitments are interrelated but suggested studying them separately.

Coladarci (1992) claimed that commitment to teaching can be measured in two ways: either by studying attrition or asking teachers directly if they would choose the same profession if they had the decision to make again. Coladarci (1992) listed working conditions among the reasons for attrition. Similarly, most of the studies focused on the predictor role of workplace conditions on teacher commitment.

Bogler and Somech (2004) studied the influence of teacher empowerment on organizational and professional commitment. In Bogler and Somech (2004), teacher empowerment was measured via six subscales: decision-making, professional growth, status, self-efficacy, autonomy, and impact. Only professional growth, status, and self-efficacy significantly predicted both types of commitment. Professional growth referred to school support for PD; status referred to getting respect and admiration from other teachers; self-efficacy referred to the belief that one has sufficient ability to help students to learn. Among these three predictors, professional growth and status are related to workplace conditions.

Canrinus, Helms-Lorenz, Beijaard, Buitin, and Hofman (2012) explored relationships between self-efficacy, job satisfaction, motivation, and commitment. They found that teachers' relationship satisfaction was the most crucial factor in

predicting professional commitment. In Canrinus et al. (2012), relationship satisfaction was measured via items related to co-workers, support, and teacher autonomy, all of which obviously affect one's workplace conditions.

Collie, Shapka, and Perry (2011) used the term *school climate* instead of workplace conditions and measured it via five subscales: collaboration, student relations, school resources, decision-making, and instructional innovations. A collaboration subscale examined the working relationships between teachers. Student relations referred to teacher perceptions of student behavior and motivation. School resources measured the availability of physical materials and equipment. Decision-making examined the level of input that teachers have in decisions that are made at the school. Instructional innovation measured openness to change and professional growth. Collie et al. (2011) found that school climate variables, particularly better student relations and greater collaboration, predicted increased organizational and professional commitment.

Similarly, Weiss (1999) examined workplace conditions by measuring perceived school leadership/culture, student behavior/social climate, teacher autonomy and discretion, socio-economic status (SES), and incentive pay plans. Weiss (1999) found that perceptions of school leadership and culture and teacher autonomy and discretion shaped professional commitment. The perceptions of school leadership and culture were measured using items some of which were similar to decision-making, school resources, and collaboration subscales used in Collie, Shapka, and Perry's (2011) study. Some other items were similar to status and empowerment subscales of Bogler and Somech's (2004) study. For this reason, this scale is more inclusive than others in terms of its ability to measure workplace conditions.

In addition to workplace conditions, Day and Gu (2007) claimed that professional and personal conditions have the potential to explain variations on teachers' effectiveness and commitment. They categorized teachers' professional life phases in six groups with respect to the years of teaching and then identified different scenarios in those phases according to different combination of professional, personal and workplace conditions. In each phase, they found both committed and non-committed teachers and attributed the difference between these teachers to distinct professional, personal and workplace conditions to which they were exposed. For example, *professional life phase 31+* denoted a group of teachers who had over 31 years' teaching experience. Day and Gu (2007) stated that in this group, pupils' progress and positive teacher–pupil relationships increased teacher commitment, whereas ill health and lack of school support resulted in a decision to exit teaching as early as possible.

2.8 The purpose of the study

The literature shows that follow-up activities are significant in the effectiveness of PD programs. Through these useful activities, teachers have an opportunity to get feedback about their attempts to try out new ideas that improve their practice. Given that online forum groups foster success in supporting teacher PD through community interaction, an online forum might be integrated into a PD workshop as a follow-up activity. In this study, the researcher examined the factors affecting primary school teachers' participation in an online forum which was set as a follow-up platform for a PD workshop about ICT integration. The study used an explanatory sequential mixed design with a quantitative initial phase and a qualitative follow-up that allowed expansion of and elaboration on the results of the quantitative phase.

In accordance with the research objective the following research questions were addressed:

Research Question 1: To what extent can teacher demographic, teacher perceived workplace conditions and teachers' attitudes to ICT integration in education predict teachers' participation in the online forum?

Research Question 2: How do teachers perceive the online forum?

Research Question 3: What do teachers think are the factors that affect their participation in the online forum?

2.9 The importance of the study

The Turkish literature on ICT integration lacks research about the PD of in-service teachers on ICT integration. Kurtoğlu and Seferoğlu (2013) found that only 3% of ICT studies were related to PD of teachers. In addition to this, to the best knowledge of the researcher, there is no study that examines an online platform as a follow-up mechanism for a PD workshop in the Turkish context. Moreover, in the worldwide literature, there are a number of studies which examine online forums as separate PD platforms, but studies which examine online platforms as a follow-up mechanism for a PD workshop are not so common. The concept of community of practice is not frequently used in the context of conducting PDs in education. Therefore, the current study is an example of a PD that forms a community of practice among teachers.

All things considered, this study contributes to the Turkish literature in that it examines a PD program about ICT integration in education. In addition, it is unique in integrating an online forum platform as a follow-up mechanism for a PD program in Turkey.

CHAPTER 3

METHODOLOGY

3.1 Research design

The study utilized a mixed method approach. The definition of this approach varied among the current leaders in mixed method research (Johnson, Onwuegbuzie, & Turner, 2007). The term was used either to name a methodology or a method. This study follows Creswell's (2015) approach, which used the term to define a research method. According to Creswell (2015), mixed methods include collection and integration of both quantitative and qualitative data. This way, the strength of each data set merges, and this combination supplies a better understanding of the research problem.

The purpose of this study is to examine factors that are related to primary school teachers' participation in an online forum which was set as a follow-up platform for a PD workshop about ICT integration. Quantitative data can distinguish factors associated with the teachers' online participation but does not explain how these factors lead to participation. Qualitative data might bring an explanation to this association. Therefore, an explanatory sequential design was appropriate for this study. According to Creswell (2015), "The intent of the explanatory sequential design is to begin with a quantitative strand and then conduct a second qualitative strand to explain the quantitative results" (p. 38).

Quantitative phase was a prediction study which was defined as "an attempt to determine which of a number of variables are most highly related to criterion variable" (Gay, Mills, & Airasian 2011, p. 203). In the current study, the criterion variable was teachers' participation in the online platform. The variables that might

be related to online participation were teacher demographics, teachers' perceived workplace conditions, and teachers' attitudes towards ICT use in education.

The qualitative phase followed a phenomenological approach. The aim of this method is to comprehend a phenomenon from the perspective of people who are involved with the phenomenon (Welman & Kruger, 2001). The qualitative phase of the study aimed at revealing teachers' perspectives about online platform and the factors related to online participation.

The qualitative and the quantitative data were integrated to explain the results of the data. According to Creswell (2015), "integration refers to how one brings together the qualitative and quantitative results in a mixed methods study" (p. 75). In this study, qualitative data helped to explain the quantitative findings presented in the chapter 5.

3.2 Participants and procedures

A purposeful sample of 89 primary school teachers in a private school chain was recruited for the initial quantitative phase of the study. The criterion for selecting participants was participation in an in-service PD program conducted with the cooperation of the private school chain and Boğaziçi University.

The chain has more than 100 campuses all around Turkey, and the in-service PD program included teachers from varying campuses. These teachers voluntarily accepted to join the workshops, but participation required a work agreement. According to this work agreement, teachers were not allowed to resign from the institution within three years; otherwise, they would have to pay back the cost of the PD program to the institution.

The program included six workshops about different topics. One of the workshops was about ICT tools to be used in education. There were 10 different ICT workshop groups: six from Istanbul, two from Izmir, and two from Ankara. Teachers working in and around these cities traveled to one of the three cities to participate in the workshop.

The school administration assigned those teachers to specific workshop groups. Each group attended the workshop in different weeks. The workshops were conducted from February 2016 to May 2016. The workshop consisted of two parts. The first part was about Internet security and was based on mostly lecturing and discussions. The second part was about utility tools that might serve both classroom learning and teachers' administrative responsibilities. During this part, the instructor demonstrated how to use the application, and then teachers manipulated the applications either on their smart phones or on their personal laptops.

Out of 140 teachers, 89 volunteerd to take part in the study and were provided no compensation. Written informed consent was obtained from each participant (see Appendix G). The majority of participants were below 30 years of age (56%) and were mostly female (79%), with teaching experience between 1 and 5 years (55%). The sample is similar to the population of private primary school teachers in Turkey in terms of gender. Most of the teachers had an undergraduate degree (79%) and high computer competence (59%). Almost half of the teachers (49%) had forum experience and they stated that mostly they simply read (42%) forum messages instead of asking questions and posting comments. Table 2 summarizes the sample characteristics.

Table 2. Characteristics of the Sample (N = 89)

Demographic characteristics	N	%
Age		
Below 30	50	56%
31-40	20	22%
41 and above[a]	17	18%
Female	70	79%
Years in teaching		
1-5 years	49	55%
6-12 years	15	17%
13-20 years	7	8%
Above 20 years[b]	17	19%

[a]Only one teacher's age was between 41 and 50.
[b]Only one teacher's teaching experience was between 21 and 30.

At the end of each workshop, participants completed a teacher demographic survey, workplace condition scale, and an attitude scale of ICT use in education. Then, they were registered for an online platform in their separate workshop group. For the qualitative phase of the study, an extreme case sampling of six teachers was recruited from the participants of the quantitative phase of the study. In extreme case sampling, the researcher chooses either extreme cases or the cases that are significantly different from the norm in some way (Boudah, 2010). In the current study, the screening criteria were based on teachers' years of work experience, their scores on a perceived workplace condition scale and their scores on attitudes toward ICT use in education scale. Table 3 shows the characteristic of the sample of the qualitative part of the current study.

Table 3. Characteristics of Sample of Interviewed Teachers (n = 6)

	1-5 Years of Teaching	Above 20 Years of Teaching
Workplace Condition Score		
High	Cemile (Female / 183)	Akif (Male / 181)
Low	Cihan (Female / 123)	Canan (Female / 141)
Attitude Score		
High	Mahmut (Male / 140)	
Low	Ersoy (Male / 96)	

Teachers are identified by pseudonyms in order to preserve anonymity. Their gender and related scores are indicated in the parentheses next to their names.

While selecting the sample, teachers' scores obtained from the perceived workplace condition scale and their years of teaching experience were considered together because the combination of these two variables might lead to variations in teacher commitment (Day & Gu, 2007). However, the number of years of teaching experience was not taken into consideration in selecting participants who had the highest and the lowest score from the attitude towards ICT scale. Among the extreme cases, teachers who stayed in Istanbul were chosen for locational reasons.

At the second phase of the study, the researcher interviewed the participants. Interviews were conducted in a quiet place after the spring term of 2016 and they were audio-recorded. Each interview lasted 25 to 90 minutes. The interviewer was the researcher, who also participated in the workshops in order to build rapport with interviewees.

3.2.1 Description of the online community

An online forum as a follow-up activity for teachers' PD workshop was created based on the community of practice framework developed by Wenger (1998). He proposed this concept after studying apprenticeship as a learning model. Wenger (1998) defined a community of practice as "groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly" (p.1). The community of practice has three important characteristics that distinguish it from any other community. Wenger (2011) listed these characteristics as domain, community, and practice. Shared domain of interest builds a group identity. Interaction among community members, who are also practitioners, is an inevitable component that leads to learning. Members of a community of practice are practitioners. In the current study, it was expected that the shared domain of interest for teachers would be an intention to learn to use the ICT applications properly. The current online forum was designed to provide an environment for teachers to share their experiences as they practiced what they learned from the PD. This exchange of experiences, which is similar to the interaction among communities of practice, is expected to bring new learning. Lastly, as the online forum required an intention to use the ICT applications, teachers should practice what they learn from the online forum. Thus, learning would dependon teachers' practice.

The online forum operated via Moodle. Moodle is a free online learning platform. It provides educators the opportunity to design their own platform which supports collaborative learning. It has several features that can be enabled or disabled, according to the course instructor's choice. Most of its features such as forums, blogs, and messaging aim at enhancing collaboration among learners In

addition, instructors can post instructional materials, give quizzes, and grade students via plugins. In the current study, only the forum feature was used.

Through its forum module, the current initiative was set as a follow-up platform for a one-day PD workshop session. It was set to support primary school teachers towards effectively integrating ICT into primary classrooms. The main objective was to encourage teachers to use the ICT tools both in their academic, administrative, and personal activities. The online forum was presented as a platform where teachers could click or download a link to reach PD documents, or they could type messages to pose questions related to educational ICT use, to reply to others' questions, and to share their experiences of ICT use. The online forum allowed participants not only to post messages on an existing topic but also to open a new topic. Discussion postings were organized both by date and by topic, as is shown in Figure I1 (see Appendix I).

The researcher created the online groups, but participation was not compulsory. The groups consisted of 13-14 teachers so as to enhance interaction, because as the group size gets smaller, interaction tends to increase (MacDonald, 2008).

Teachers were registered for the online forum after they completed the workshop sessions. The researcher registered teachers with a username and password and sent them to the teachers via email. Since the workshops were in different weeks for different teachers, registration for the online forum increased gradually. The online platform was open for the spring term of 2015–2016 academic year (March-June).

3.2.2 The role of the researcher

The researcher was the facilitator of the online community. The facilitator posted questions and responses to postings as a means of keeping conversations moving or to anticipate topics that might be interesting or helpful to the participants. For example, the facilitator asked teachers what kind of experience they had during their classroom practice of the ICT applications. The facilitator also posted a question that was asked in a private email from a participant. One teacher asked about a specific problem with one of the ICT applications. Then the facilitator posted this question on the forum with the teacher's permission, but without identifying the teacher. In addition to posting questions, the facilitator posted responses to teachers' posts. These responses consisted of thank-you messages for sharing their experiences in order to encourage others to post (see Figure I2 in Appendix I). Besides the forum posts, the facilitator also sent private emails to all forum users to increase participation in case there existed participants who did not receive forum posts properly. These emails were sent to remind teachers of their username and password and to invite them to upload their photos on the forum so that their social presence could be enhanced (Kirschner & Kreijns, 2005). The facilitator was more active for the newcomers to the online forum and was careful not to post on the discussion boards too frequently so as not to overpower the participants' voices on the forum.

3.3 Instrumentation

The instruments used for the research included quantitative and qualitative measures. Quantitative data was collected through a teacher demographics survey, a perceived workplace condition scale, attitudes towards ICT in education scale, and log reports

of the online forum. Qualitative data was collected using classroom observation notes and semi-structured interviews.

3.3.1 Teacher demographics survey

This survey consists of multiple-choice items. Table 4 presents the teacher demographics.

Table 4. Teacher Demographics Survey Content

Variables					
Age	30 and below	31-40	41-50	51 and above	
Sex	Female	Male			
Years in Teaching	1-5	6 -12	13-20	21-30	Above 30
Computer Competence	Inadequate	Average	Good	Very Good	
Participation In Any Online Forum	No	Yes			
Way of Participation	Reading Messages	Writing Comments	Asking Questions to Others		

3.3.2 Teachers' perceived workplace condition scale

This scale was developed by extracting certain items from Weiss's (1999) study. Weiss (1999) measured the teachers' perceived workplace conditions via teacher attitude questions taken from the Schools and Staffing Surveys (SASS). This survey collected information on teacher demographics, education and training, teaching assignment, experience, certification, workload, perceptions and attitudes about teaching, job mobility, and workplace conditions. Weiss (1999) found four factors related to workplace conditions: "perceived school leadership, autonomy and discretion, social climate, and all of which have been associated with teacher commitment in the literature" (p. 864). Among these factors, Weiss (1999) found that perceived school leadership and teachers' autonomy and discretion were strongly related to teacher commitment. Therefore, only items related to these two factors were extracted to measure teachers' perceived workplace conditions in the current study.

There were fifteen 4-point rating questions (1 = "strongly disagree". 4 = "strongly agree") about school leadership/culture. There were five 6-point rating questions (1 = "none". 4 = "a great deal") about teacher autonomy/discretion. The three items which demonstrated negative coefficients when the regressions were run were reverse coded later in this factor. The perceived workplace conditions score was calculated by adding the score of each factor. Each factor score was calculated by adding the value of each item in the related factor and standardizing the factor score. The total score varied between 42 and 200, where higher scores represented positive perception towards workplace conditions.

The scale was first translated from English to Turkish by the researcher. Then a Turkish-English bilingual checked the translation in terms of grammar and

meaning. Later, an expert did the last check. Lastly, a confirmatory factor analysis (CFA) was conducted to validate the scale. AMOS statistical software was used for the CFA.

Yang (2005) defined CFA as "a hypothesis-testing process, examining whether the correlation/covariance matrix of measured variables from the data is equal to that of a hypothesized factor model" (p.195). He claimed that it is more suitable to use CFA in confirming a predetermined factor structure based on the related literature.

In the current study, only items that belonged to two separate factors in Weiss (1999) were included. Therefore, the CFA was conducted using a model with two factors (see Appendix J, Figure J1). However, the data did not fit the model successfully (Normed fit index (NFI) = .610; comparative fit index (CFI) = .739; root mean square error of approximation (RMSEA) =.114). Thompson (2004) suggested that for a good model fit, the NFI and CFI should be more than or equal to .95, while the RMSEA should be less than or equal to .60, neither of which was satisfied in the current study. Thompson (2004) suggested that researchers revert to Exploratory Factor Analysis (EFA) when the CFA contradicts their expectations. In the EFA, "the researcher may not have any specific expectations regarding the number or the nature of underlying constructs or factors" (Thompson, 2004, p. 5). Statistical software SPSS was used for the EFA.

Initially, the factorability of the 20 perceived workplace condition items was checked. In order to do that, the correlation matrix was first examined, and it was found that there was no item which correlated at less than .30 with all other items, suggesting reasonable factorability. Secondly, the Kaiser-Meyer-Olkin measure of sampling adequacy was recommended to be above .60, and it was .804 in the current

study. Finally, Bartlett's test of sphericity was significant (c^2 (190) = 850.091, p < .05). The communalities were all above .30, further confirming that each item shared some common variance with other items. According to the aforementioned indicators, all 20 items were included in the factor analysis.

The aim of the factor analysis was to identify and compute composite scores for the factors of perceived workplace conditions. Therefore, a principle components analysis was conducted. According to the initial Eigen values which were above one, first four factors explained 35%, 10%, 9%, and 7% of the variance, respectively. A parallel analysis was conducted to determine the number of factors to retain. In a parallel analysis, eigenvalues from a randomly generated correlation matrix was calculated by a software engine according to the number of variables and the sample size (Patil, Surendra, Sanjay, & D. Todd, 2007). The factors whose random eigenvalues were less than their real eigenvalues were to be retained in the model (Horn, 1965 in Patil et. al., 2007). When the parallel analysis was conducted, it was found that only first three factors could be retained in the solution. Thus, the three-factor solution, which explained 54% of the variance, was preferred. A varimax rotation was conducted because the component correlation matrix indicated weak correlations — below .50 — among the factors.

Items with a primary factor loading of .4 or above were to be included in the analysis. The item "Great deal of cooperative effort among staff members" did not load above .4 on any factor. Therefore, it was eliminated.

A principle-components factor analysis was conducted with 19 items, using varimax rotations, and restricting the number of factors to three. The three factors explained 56% of the variance. Eighteen items had primary loadings over .50 and

only one item had a primary loading above .40 (Establishing curriculum). The factor loading matrix for this final solution is presented in Table 5.

Table 5. Varimax Rotation Factor Loadings for Perceived Workplace Conditions

Item No	Factor 1	Factor 2	Factor 3
1	.841		
2	.807		
3	.805		
5	.786		
4	.713		
6	.707		
7	.583		
10	.540	.521	
12		.771	
15		.767	
14		.626	
13		.577	
9		.548	
8	.502	.518	
19		.468	
17			.748
18			.718
20			.633
16			.612

The factor labels proposed by Weiss (1999) suited the extracted factors, but the school leadership factor was separated into two. In Weiss's (1999) study, items from 1 to 15 were loaded under the school leadership factor, and the items from 16 to

20 loaded under the teacher autonomy and discretion factor. In the current study, the first eight items loaded on the school leadership factor, while the items from 9 to 15 and 19 loaded on a separate factor, which was equivalent to Collie, Shapka, and Perry's (2011) decision-making subscale, which refers to the level of input that teachers have in decisions that are made at the school. Item 19 was "At this school, how much actual influence do you think teachers have over school policy in establishing curriculum?" This item was related to decision-making factor of Collie, Shapka, and Perry's (2011) study more than teachers' perceived autonomy in their classes. Internal consistency for each of the scales was examined using Cronbach's alpha. The alphas were high both for school leadership (eight items) and decision-making (seven items), .80 and .75, respectively, whereas Cronbach's alpha for teacher autonomy (four items) was moderate, at .65. No substantial increases in alpha for any of the scales could have been achieved by eliminating more items.

The reliability coefficient of the total scale was not calculated in Weiss (1999). In the current study, the reliability for the workplace condition (Cronbach's alpha) was .89.

3.3.3 The teachers' attitudes towards ICT in education scale

The scale collects information about teachers' views on the effects of ICT in teaching and learning and on the obstacles to ICT implementation. It was in Turkish, developed by Cavas, Cavas, Karaoglan, and Kisla (2009). The scale included 38 four-point rating items ranging from "strongly disagree" to "strongly agree." The teachers' attitude score was calculated by adding the value of all items. The total score ranged from 38 to 152. Eleven of the items were negatively worded. For the

analysis of the data, all negatively worded items were reversed so that a higher numbered response on the rating scale would represent positive attitudes.

When the instrument was developed, its reliability (Cronbach's alpha) was reported as .91 (Cavas, et al., 2009). In the current study, Cronbach's alpha for the scale was .84.

3.3.4 Log reports of the online forum

Participation in the online forum was identified by the log reports of the online forum. The researcher had access to the log reports from the Moodle platform. The log reports included information about each participant's username, the user activity in Moodle, the timing of the activity, and the content of the related activity. Teachers who had logged in to the online platform at least once were identified as having participated in the online forum, and this variable was dummy coded.

3.3.5 Classroom observation notes

The researcher observed six teachers in their lessons for a one-hour (40 minutes) class. During the observation, the researcher kept written records of the existing ICT infrastructure in classrooms, teachers' use of ICT, and the ICT tools that were used during the classes. The researcher made bulleted lists of basic observations. Observational data was used to support findings from other data analysis.

3.3.6 Semi-structured interviews

Teachers' beliefs about the factors affecting their participation patterns were elicited by semi-structured interviews. Conducting semi-structured interviews is a way to collect data from participants by which the interviewer asks predetermined questions.

Interview questions elicit a mixture of closed and open responses from the interviewees. Even though predetermined questions set a structure for the interview, the interviewees hav a degree of freedom to decide what to talk about, how to express themselves, and how much to talk (Drever, 1995).

The method of hierarchical focusing was followed during the interviews. Tomlinson (1989) proposed this method so as to keep the interview open enough to gain access to interviewees' opinions while it restricted the interview into the researcher's agenda. According to Tomlinson (1989), a non-directive style of interaction through open-ended interview questions keeps the researcher framing and influence to a minimum. Tomlinson (1989) listed main steps as follows:

i. Conceptualizing the nature of the domain of the topic based on the researcher's own construal,
ii. Deciding on the research focus within this conceptualization,
iii. Creating a diagram for a hierarchical agenda of questions that would elicit interviewees' construal about the focus of the research,
iv. Carrying out the interview, and
v. Making a verbatim transcript from an audio recording of the interview.

In the current study, an online forum construal interview agenda was used during the interview (see Table 6). This construal involved three main questions and sixteen sub-questions. Each interview question was followed by two letters with empty parentheses next to them. The interviewer marked the questions with two letters during the interview: s for spontaneous or p for prompted answers.

Table 6. Online Forum Construal Interview Agenda

(1) As you see it, what does the online forum involve?	p( )	
What is the aim of the online forum?	p( )	s( )
What is the content of the online forum?	p( )	s( )
Who are the participants of the online forum?	p( )	s( )
What is the role of the teachers in the online forum?	p( )	s( )
What is the role of the admin in the online forum?	p( )	s( )
(2) What do you think teachers' participation in the online forum would depend on?	p( )	
Design Factors		
What should be the content which is created by teachers?	p( )	s( )
What should be the content which is created by admin?	p( )	s( )
How much message is needed for real effect?	p( )	s( )
Does it depend on ease of MOODLE use? Please explain.	p( )	s( )
Does it depend on technical support? Please explain	p( )	s( )
Does it depend on structured task presentation for the forum use? Please explain	p( )	s( )
Individual Factors		
Would training for online forum use be needed for teachers? Why?	p( )	s( )
Do you believe that you can find answer to your questions in the forum? Why?	p( )	s( )
Do you have enough time to participate in the forum? Why?	p( )	s( )
Workplace Factors		
In what kind of classroom/school environment could you apply what you have learned in the workshop?	p( )	s( )
What role does the school administration have in applying what you have learned in the workshop?	p( )	s( )
(3) What kind of follow-up platform would you design?	p( )	

The order of the questions in an interview might affect an interviewee's answer (Drever, 1995). In the hierarchical focusing method, the interviewer asks the main questions directly and avoids asking sub-questions so as not to influence the

interviewee's answer (Tomlinson, 1989). Therefore, in the current study, the interviewer asked the main questions directly. If the interviewee's answer was related to any sub-question, the interviewer marked this question as spontaneous (s) and did not ask that sub-question. If an answer to the main question was completed but there existed unanswered sub-questions, the interviewer asked these sub-questions and marked them as prompted (p).

The first main question was asked to start the interview with a preamble. Drever (1995) indicated that a preamble prevents misunderstandings about the focus of the interview. In the current study, some of the interviewees had not logged into the online platform before the interview was conducted. Therefore, their perception of the online forum might be different from the participants who had logged into the online platform. As a result, their perceptions of factors related to online participation might be different from those of other participants. In order to bring a common understanding about the online forum, first the interviewee's construal of online forum was elicited through the first main question. If their perception was different from the actual online platform, the interviewer explained the existing online platform, using the related sub-questions.

The last two main questions were asked to elicit teachers' perceptions about factors affecting their online participation. Holstein and Gubrium (2003) claimed that participants may avoid explaining things explicitly for "fear of making a discrediting statement" (p. 65). Interviewees might feel judged by the interviewer if they were asked why they did not participate in the online platform. This might disturb rapport and influence their answers. Instead of asking questions directly, the researcher asked teachers the factors related to online participation in general, to lead participants to a comfortable place. Thus, they would unpack their ideas.

Sub-questions to the second main question were created parallel to the variables in the quantitative phase of the study. There were three groups of sub-questions related to design of the platform, individual factors, and perceived workplace conditions.

A pilot interview conducted with a teacher who was among the participants of the study. Drever (1995) suggested choosing a pilot interviewee who was not a potential candidate for the interview. Therefore, the teacher was chosen among the participants who lived outside Istanbul.

In the pilot interview, the interview agenda was used, but the question, "What kind of follow-up platform would you design?" was asked as a sub-question for the main question "What do you think teachers' participation in the online forum would depend on?" As an answer to this question, a teacher explained a WhatsApp® group, which she found very effective. Then, she answered all sub-questions according to this mobile application. This question distracted the teacher from online platform. After the pilot, this question was set as a distinct main question and asked at the end of the interview in order to maintain teachers' construal of the online forum.

3.4 Data analysis

Quantitative and qualitative data were analyzed separately. Variables were summarized using counts and proportions for categorical variables (gender, age, work experience, forum experience, computer competence, and participation in an online forum) and means and standard deviations for continuous variables (perceived workplace conditions, attitudes towards ICT use in education). Logistic regression was conducted to investigate the impact of teacher demographics, teachers' perceived workplace conditions, and teachers' attitudes on teachers' participation to

the online forum. In predicting a categorical variable, either discriminant or logistic, regression is suitable. Discriminant analysis is used if the predictor variables are continuous. Leech, Barrett, and Morgan (2005) suggested conducting a logistic regression in predicting a categorical variable when the predictor variables involve both continuous and categorical variables. In the current study, the outcome variable was teacher participation, and this variable was categorical. The predictor variables involved gender and forum experience as categorical variables, and age, work experience, computer competence, perceived leadership, perceived autonomy, and attitudes towards ICT use in education as continuous variables. Therefore, logistic regression was suitable for the analysis. Quantitative data analysis was facilitated using the SPSS 21 statistical software package.

According to Leech, Barrett, and Morgan (2005) the requirement of logistic regressions is as follows:

- The dependent variable should be dichotomous
- The outcomes should be independent and mutually exclusive
- The sample should include a minimum of 60 total cases
- Multicollinearity should be little

In addition, Field (2011), listed linearity and independence of errors as assumptions of logistic regression. He stated that "logistic regression assumes that there is a linear relationship between any continuous predictors and the logit of the outcome variable" (p. 769).

The assumptions of logistic regression were checked before doing the analysis, and no violations were found, except for the multicollinearity. As the assumptions indicated, the dependent variable was participation in the online forum, and it was dichotomous. The outcomes were independent and mutually exclusive.

Although sample size (N=89) was larger than 60, the numbers of variables was kept to a maximum of 9 because Vittinghoff and McCulloch (2007) suggested that there should be 10 events per variable. The perceived workplace condition is the combination of the perceived leadership, decision-making, and perceived autonomy. In order to keep the number of variables as low as possible, workplace condition was added to the model instead of taking its factors separately. Similarly, reading and the other sub-variables of forum experience were eliminated, and forum experience was added to the model as an umbrella variable.

In order to check for multicollinearity, first the correlation matrix of the predictor variables was created (see Table K1 in Appendix K). Correlation matrix indicated large correlations between work experience and age, decision-making and leadership, sharing and asking. In addition to the correlation matrix, Leech et al. (2005) and Field (2011) suggested obtaining tolerance and VIF scores via a linear regression command in SPSS to check for multicollinearity. Table 7 shows the tolerance and VIF scores.

Alison (2012) stated that the lower level of VIF scores that constitute a problem varies among the authorities and suggested VIF scores greater than 2.5 are problematic. According to this suggestion, work experience and age indicate high multicollinearity. Leech et al. (2005) suggested aggregating or eliminating variables that are highly correlated in order to deal with multicollinearity. Since work experience was more important to the current study, age was eliminated.

Table 7. Tolerance and VIF Scores for Predictor Variables

Predictor Variables	Collinearity Statistics	
	Tolerance	VIF
Gender	.752	1.330
Work Experience	.127	7.851
Age	.131	7.656
Education	.690	1.450
Computer Competence	.881	1.135
Forum Experience	.165	6.049
Attitudes Towards ICT in Education	.767	1.304
Workplace Conditions	.277	3.613

The interaction term between the continuous predictors and their log transformation were added into the model and found to be insignificant. Therefore, the assumption of linearity was not violated.

There are three model-building approaches in regression techniques: direct, hierarchical, and stepwise. They are used for different purposes. In the direct approach, all predictor variables are entered into the model simultaneously when there is no prior hypothesis about which variables have greater importance than others. In the hierarchical approach, predictor variables are entered into the model sequentially in order to examine the contributions of variables according to their predetermined priority. In the stepwise approach, the computer enters the variables into the model according to mathematical calculations. In the current study, the direct approach was followed due to a lack of theory about the hierarchical importance of the variables on online participation. Attitude, computer competence, forum experience, work experience, and perceived workplace conditions were added to the model simultaneously.

Conventional content analysis was used in order to explore teachers' ideas about the factors that affect their participation pattern in the online community. Hsieh and Shanon (2005) suggested using a conventional content analysis to describe a phenomenon, especially since the literature lacks extensive theory and studies about the phenomenon. There exist studies which examine the factors affecting teachers' online participation in PD forums. However, those PD forums were not set as a follow-up support activity for PD programs, unlike in the current study. As the aim of the platform changes, the factors related to its participation might also change. As online forums as a follow-up support activity for PD workshops are not examined extensively in the literature, the conventional content analysis is suitable for the current study. Hsieh and Shanon (2005) suggested the following steps for conducting a conventional content analysis:

i. Reading all data in order to have a general perspective
ii. Reading data word by word in order to code data
iii. Approaching the coded data in order to write preliminary analysis notes
iv. Sorting the related codes into categories which are not predetermined
v. Developing a tree diagram to organize categories hierarchically
vi. Defining the categories, subcategories and codes

These steps were followed in the current study. The researcher transcribed the interviews via Microsoft Word and read them before coding in order to familiarize herself with the data. The researcher uploaded the interview transcriptions using an online qualitative analysis tool to code and analyze the qualitative data. The web-based interactive software is called QCAmap®. The software helped the researcher to highlight certain sections from the text to be coded with different colors. After the coding was finished, the software enabled the researcher to group related codes to

create distinct categories. In addition, the software supplied the researcher with analysis results on three Microsoft Excel documents. The Microsoft Excel documents presented the coded passages, category statistics, and document statistics, respectively. In the coded passages, each code was accompanied by the related passages from the interview transcripts. In addition to passages, teachers' names were accompanied by the related codes. In category statistics, each category with its related codes is represented, and the frequency of the categories and codes is displayed on the document. In document statistics, it was demonstrated how many of each code was brought by each teacher. These analysis reports were obtained for each research question. Among these documents, only coded passages were used in the analysis.

Saldana (2013) stated that the qualitative analytic process is cyclical and suggested two types of coding methods for researchers to follow. In the current study, Saldana's (2013) suggestion was followed and the analysis was completed in two cycles. In the first cycle, data was coded and these codes were classified, integrated, and synthesized in the second cycle. In vivo coding was followed in the first cycle. This method assigns labels for codes from participants' own words or short phrases which are found in the qualitative data record (Saldana, 2013). Since the current study examines teachers' perceptions about the factors that affect their online participation, in vivo coding helped to frame their interpretations with their own words. The researcher had two areas of focus during coding: teachers' perception of the online follow-up forum and their beliefs about the factors affecting the online participation. There were 135 codes related to forum perception and 186 codes related to factors affecting online participation.

After the first cycle of coding, the researcher categorized the codes. The codes related to teachers' perception of the online follow-up forum were categorized into six groups: the aim, content, members, members' forum activities, and forum admin's activities of online follow-up forum. The codes related to factors affecting online participation were categorized via three iterations. At first iteration, 15 clusters of initial codes appeared: habit, individual differences, feeling a need, online practices, the content, attitudes towards other users, obligation, the school, familiarization with the platform, sustainability, design, facilitation, consumption culture, worries, and learning style. This categorization was revised because some categories were broad such as individual differences and some categories were out of the focus of the study such as design of the platform. Psychological motivations which shape acceptence to use an information system are different from the ones that shape continuance to use an information system (Bhattacherjee, 2001 in Islam, 2012). Design characteristics are related to continuance of the participation in the platform. In the current study, online participation was defined as logging into the forum at least once, not repeated participation. Therefore, similar codes were united and some codes were left. Remaining codes were categorized, and axial coding was conducted. Axial coding serves to reassemble data which were split or fractured during the first coding cycle. Axial coding connects categories with subcategories in a way that it helps to specify the dimensions of a category (Saldana, 2013). In order to conduct axial coding, two concept maps were created. To create first concept map, the researcher read the preliminary analysis of the data and wrote most uttered codes on rectangular sheets of paper (4cm x 5cm) separately. Then the researcher read the preliminary analysis notes again, this time sentence by sentence. This time, the researcher wrote each code that appeared concurrently with the most-uttered codes

on the same papers. The researcher linked each code with the most-uttered codes with a line segment. When the most-uttered codes appeared concurrently in the same sentence, a link between the papers was drawn. This links between and within the papers were created by the online mind mapping tool Bubble.us®. The first mind map depicted the relationships between these first cycle codes (see Figure L1 in Appendix L). The second concept map depicted hierarchical relationships between different categories that appeared on the first concept map (see Figure L2 in Appendix L).

3.5 Validity and reliability

In order to ensure trustworthiness in the current study, certain strategies were followed. Internal validity, which is referred to as credibility in qualitative data, refers to extent of the match between research findings and reality (Merriam & Tisdell, 2015). Three strategies were followed to shore-up internal validity: triangulation, member check, and peer review (Merriam & Tisdell, 2015).

There are four kinds of triangulation: the use of multiple methods, multiple sources of data, multiple investigators, and multiple theories to confirm findings (Merriam & Tisdell, 2015, p. 244). In the current study, multiple methods of data collection were used. In addition to interviews, teachers' ICT use was observed in their classrooms.

Member check refers to soliciting feedback on the emerging findings from some of the interviews (Merriam & Tisdell, 2015). In the current study, all interviewees were asked to supply feedback about the preliminary findings. Teachers were sent the analytical memos of their interviews separately via email. Out of six interviewees, four confirmed the emerging findings without any correction. Only one

interviewee made a correction to the findings. In the analytical memo, it was written that the teacher did not believe that s/he could get help from other teachers in terms of ICT. However, this teacher asked the researcher to change it, staging that s/he did get help from his/her colleagues in ICT, but not from teachers working in the same school.

In addition to the member check, an expert scanned some of the raw data and assessed the plausibility of the findings based on the data, as Merriam and Tisdell (2015) suggested.

Reliability or consistency deals with the question of how much research findings can be replicated. In addition to triangulation and peer review, an audit trail was conducted to ensure consistency (Merriam & Tisdell, 2015). In an audit trail, the researcher explains the procedure and data analysis in detail. In the current study, they were explained in the methodology section.

External validity refers to "the extent to which the findings of one study can be applied to other situations" (Merriam & Tisdell, 2015, p. 253). In qualitative studies, generalizability cannot occur due to lack of a priori conditions such as control of sample size, random sampling, and so on (Merriam & Tisdell, 2015). Instead, generalizability needs to be considered appropriate to qualitative research. Merriam and Tisdell (2015) suggested thick description and maximum variation in the sample as useful strategies to enhance the possibility of transferring the results of a qualitative study to another setting. The researcher supplied a thick description by explaining the setting and participants of the study in detail and by describing the findings with quotes from participant interviews. In order to enhance the maximum variation in the sample, critical sampling was conducted so that participants with different profiles were involved in the qualitative part of the study.

CHAPTER 4

RESULTS

The overall intention of this mixed-methods study was to see if teachers' demographics, attitudes towards ICT use in education, and perceived workplace conditions were predictors for participation in an online forum that was set as a follow-up activity for a PD workshop. The quantitative component of the study measured teachers' attitudes towards ICT use in education and their perceived workplace conditions. Then, in addition to teachers' attitude and perception scores, teacher demographics were used to determine if all of them were predictor variables. The qualitative part of the study was conducted to explain the results of the quantitative part. Therefore, teachers were interviewed about the factors that affect participation in the online forum.

The findings for this research study will be presented in three sections. The first section will present the descriptive statistics of the quantitative data in order to help contextualize the findings derived from the data. Section 4.2 will focus on the findings from the logistic regression analysis of data collected for the quantitative part of this study. Section 4.3 will focus on the findings from the analysis of data collected for the qualitative part of this mixed-method study.

4.1 Descriptive statistics

Descriptive statistics of categorical variables (gender, age, work experience, forum experience, computer competence, and participation to online forum) and continuous variables (perceived workplace conditions and attitudes towards ICT use in education) that were used for this study are presented in Table 8.

Table 8. Descriptive Statistics for Continuous Variables

	Total			Participated			Not Participated		
	N	M	SD	N	M	SD	N	M	SD
Attitudes towards ICT in education	89	112.8	11.7	33	115.1	11.1	56	111.5	11.9
Perceived workplace condition	89	146.7	23.2	33	153.8	19.6	56	142.5	24.3

The possible score range of teachers' attitudes towards ICT in education was from 38 to 152; the average total score of teachers' attitudes towards ICT in education was 112.843, which can be interpreted as high. The possible score of teachers' perceived workplace conditions ranged from 0 to 200; the average total score for teachers' perceived workplace conditions was 146.074.

Table M1 (see Appendix M) presents the frequency of categorical variables, both for whole group and for the participants who participated in the online follow-up forum. Whole group was represented under the label "Total" and the teachers who logged into the online follow-up forum were indicated below the "Participated" column in the table. The percentage of each demographic variable is generally similar for the total and the participated group. Teachers who were below 30 years of age had teaching experience of 6 to 12 years, held an undergraduate degree, had computer competence above medium level, and were familiar with forums, which weighed more in the participated group than the total group.

4.2 Findings of the quantitative data analysis

A logistic regression was conducted to answer the first research question:

To what extent can teacher demographic, teacher perceived workplace conditions and teachers' attitudes to ICT integration in education predict teachers' participation in an online forum?

The work experience variable included only one case for the category of 21-30 years of teaching. Therefore, this category was combined with the category of above 30 years of teaching and named as 21 and above years of teaching before the logistic regression analysis. Accordingly, the logistic regression model was as follows:

Predicted logit of (Participation) = β_0 + β_1 (Female + β_2 (6-12 years of teaching) + β_3 (13-20 years of teaching) + β_4 (21 and above years of teaching) + β_5 (Good Computer Competence) + β_6 (Very good computer competence) + β_7 (Forum Experience) +β_8 (Attitudes to ICT) + β_9 (Perceived workplace conditions) + e

Burns and Burns (2008) explained logit (p) and odds ratio as follows:

> Logit (p) is the log (to base e) of the odds ratio or likelihood ratio that the dependent variable is 1. For a dichotomous variable, the odds of membership of the target group are equal to the probability of membership in the target group divided by the probability of membership in the other group. (p. 572)

In this study "Predicted logit of (Participation)" is equal to the log of the probability of participation divided by the probability of non-participation.

According to the logistic regression analysis, a test of the full model against a constant only model was statistically significant, indicating that the predictors as a set reliably distinguished between participating teachers and not participating teachers (chi square = 18.377, p = .031 with df = 9). Well-fitting models show non-significance on the *H-L goodness-of-fit test*. This desirable outcome of non-significance indicates that the model prediction does not significantly differ from the observed. *H-L statistic of the current study* has a significance of .135, which means

that it is not statistically significant and therefore the model is quite a good fit. Nagelkerke's R^2 of .259 indicated that approximately 26% of the variance in whether or not teachers participated in the online follow-up forum can be predicted from the linear combination of the ten independent variables. Prediction success overall was 73.6 %. Table 9 shows that the independent variables were better at helping us predict who would not participate in the online follow-up forum (87% correct) than those who would (51.5% correct).

Table 9. The Observed and the Predicted Frequencies for Online Participation by Logistic Regression with the Cutoff of 0.50

Observed	Predicted		% Correct
	Participated	Not Participated	
Participated	17	16	51.5
Not Participated	7	47	87.0
Overall Percentage			73.6

The results of the logistic regression model are presented in Table 10. In order to explain the table, it is beneficial to unearth the meaning of β and odds ratio. The βs are the logistic regression coefficients. Negative βs reveal a negative or inverse relationship, whereas positive βs indicate a positive relationship. For example, attitudes to ICT was positively related to participation in the follow-up online forum, and having no prior forum experience was negatively related to participation in the online follow-up forum. The odds ratios in the last column are more straightforward in interpretation than the βs (log odds). Odds ratios can be interpreted in terms of the change in odds. The odds are the probability that an event will happen divided by the probability that the event will not happen. If the odds

ratio exceeds 1, the odds of an outcome occurring increase for each one unit increase in the continuous predictor; if the figure is less than 1, any increase in the predictor leads to a drop in the odds of the outcome occurring.

Table 10. Logistic Regression Analysis of 89 Teachers' Online Participation

	β	S.E.	Wald	df	*p*	Exp(*β*)
Workexp			1.084	3	.781	
WORKEXP (6-12 years)	.629	.685	.843	1	.359	1.875
WORKEXP (13-20 years)	.592	.971	.372	1	.542	1.808
WORKEXP (above 30 years)	.239	.718	.111	1	.740	1.270
Computercom			1.355	2	.508	
COMPUTERCOM (good)	.567	.691	.672	1	.413	1.762
COMPUTERCOM (very good)	1.007	.873	1.332	1	.248	2.738
Forumexp (yes)	1.380	.542	6.484	1	.011	3.976
Attitudes to ICT	.022	.024	.870	1	.351	1.022
Workplace conditions	.033	.012	7.181	1	.007	1.034
Gender (female)	.676	.677	.998	1	.318	1.966
Constant	-9.875	3.649	7.322	1	.007	.000

Note. Workexp = work experience. Computercom = computer competence. Forumexp = Forum experience.

With respect to the categorical variables, the interpretation of the odds ratio for a particular group reflects how the odds of an outcome occurring for a specific group compares with the odds for the reference group.

The Wald criterion demonstrated that only workplace conditions and forum experience made a significant contribution to prediction (p = .007 and p = .011 respectively). Every 1-point increase in the perceived workplace condition score

results in a 3% increase in the odds that a teacher participated in the online follow-up forum. In terms of forum experience, the odds that a teacher with prior forum experience participated in the online follow-up forum is approximately 4 times greater than the odds that a teacher without prior forum experience participated in the online follow-up forum.

The other predictors were also associated with the participation, but not significantly. When teachers with 1-5 years of work experience were taken as the reference group, the odds of participation for teachers with above 30 years of work experience is approximately 27% higher; the odds for teachers with 13-20 years of work experience is approximately 80% higher; and the odds for teachers with 6-12 years of work experience is approximately 86% higher. Higher computer competence is more likely to predict participation. The odds that a teacher with good computer competence participated in the online follow-up forum is approximately 76% higher than the teachers with medium-level computer competence. In addition, the odds that a teacher with very good computer competence participated in the online follow-up forum is approximately three times of the odds that a teacher with medium-level computer competence participated in the online follow-up forum. In terms of attitudes to ICT in education, every 1-point increase in attitude score results in a 2% increase in the odds that a teacher participated in the online follow-up forum. Female teachers were more likely to participate in the online follow-up forum; the odds for female teachers were approximately two times greater than for the male teachers.

4.3 Qualitative findings

Qualitative findings were obtained from the qualitative analysis of both classroom observation notes and from interview transcripts. The observation notes were used to examine teachers' ICT use in their classes. These findings were presented to produce teacher profiles in terms of ICT use. Since the online follow-up forum was based on the use of ICT applications, the analysis of teachers' habits of ICT use might contribute to the analysis of the interview transcripts. The interview transcripts helped to explore the factors that affect participation in the online follow-up forum. First, teachers' perception of the online follow-up forum was identified by considering the goal, content, participants, and participants' roles in the forum. Then the factors related to forum participation were presented under the five themes that resulted from the content analysis. The findings were exemplified by quotes from the interviews. The researcher translated the quotes from Turkish to English.

4.3.1 The classroom and the ICT use

All classrooms were equipped with an interactive whiteboard that was connected to the Internet. The only board that can be written on was the interactive whiteboard. There were 16-20 students sitting in clusters. Clusters consist of two desks pushed together so every desk was facing another one. The classrooms had clusters scattered around so that each cluster would be far enough apart to prevent the students' chairs from hitting each other.

All the teachers made use of the ICT tool during their lessons. Teachers integrated ICT tools either to enhance academic objectives or to manage classroom behaviors. With regard to the academic use of ICT tools, it generally served to present information and for drill and practice exercises. In terms of classroom

management, it helped teachers to give students feedback about their behaviors, both desired and undesired.

4.3.1.1 Academic ICT use

Academic ICT use referred to classroom activities which were designed to bring students to predetermined learning objectives of the school subjects. Cemile, Akif, and Ersoy used ICT to transmit information. At the beginning of the lesson, Cemile tried to open Plickers® on the interactive whiteboard but could not manage it. Then she started to present the subject via a PowerPoint presentation on the interactive whiteboard. She read the explanations written on the PowerPoint slides. This suggested that she used ICT for transmission of information. Like Cemile, Ersoy introduced a new topic in his class. The aim of the lesson was learning vocabulary. In order to introduce words, he split the interactive whiteboard into four as a 2x2 matrix. Four parts served for writing the meaning of the word, other related concepts, features of the word (singular/plural, noun/verb), and for illustrating the word, respectively. Each part was filled after a class discussion. In this activity, teacher firstly made use of the interactive whiteboard in order to split the board properly. He used the shape recognition pen tool in order to replace his drawings on the page with line segments. In addition, he made use of ICT when he searched web for visuals related to the vocabulary. This attempt to enrich his instruction with different materials might be considered as the transmission of the vocabulary knowledge. Similarly, Akif also used ICT as a tool to present information. The subject of the lesson was microscopic creatures. At the beginning of the lesson Akif explained students that they would review the subject that was covered at the last lesson. He used a video for revision of the subject. The video included both visuals information

and subtitles. In addition, the subtitles were accompanied by sound recording. The video was displayed on the interactive whiteboard.

Canan, Mahmut, and Cihan conducted drill and practice exercises via ICT tools. Canan and Mahmut managed their instruction similarly. They opened the pdf version of the textbook on the interactive whiteboard and projected certain pages. These pages included drill and practice exercises in which students were expected to fill in the blanks of the given sentences on the board. Similarly, Cihan asked students to come to the interactive whiteboard to complete drill and practice exercises which were about using the punctuation marks correctly. However, she projected the sentences from a PowerPoint presentation and delivered children play dough to shape as suitable punctuation marks and stick in a proper place in the sentence on the interactive whiteboard. In the aforementioned classroom activities, the use of ICT tools saved time in the lesson because teachers projected the pages on the interactive whiteboard instead of writing all of them on the interactive whiteboard.

4.3.1.2 ICT use for classroom management

ICT use for classroom management referred to activities which were conducted to maintain classroom rules and procedures during the school day. It was observed that only female teachers used a specific application in order to manage students' behaviors. Some teachers who participated in the workshop reported that this application was suggested by the administration. This application was designed to connect teachers, parents, and students for sharing photos, videos, and messages throughout the school day. During the observation, teachers only used the application in order to give feedback about students' behaviors. In order to do that, they used the classroom feature of the application. This feature helps teachers to build a classroom

culture by choosing skills and values things such as creativity or teamwork to be evaluated. Each student has an avatar and for the preset skills and values they collect points from teachers. Teachers can both increase and decrease the total points of the students. During the observations, teachers changed some students' points on the interactive whiteboard so that every student in the classroom witnessed the result of a specific behavior.

4.3.2 Planning for ICT use

Planning for ICT use means teachers' allocating time beforehand in order to search or prepare for ICT use in the coming lesson. Teachers were divided into two groups in terms of planning for ICT use. The materials that were used during the class supplied information about lesson planning for ICT use. For example, if the materials were ones that were supplied by the school, this suggested that teachers did not allocate time for preparation for ICT use. On the other hand, if the materials were either something different from the school resources or if they were prepared by the teacher, this implied that the teacher had done some preparation. School resources included textbooks and an educational platform which included several types of educational tools, such as tutorials, tests, videos, documentaries, and homework.

Akif, Cihan, and Cemile seemed to spare their time to plan for ICT use. The video used by Akif suggested that, he tended to integrate ICT through existing educational materials. Even though it was an on-hand material, it was not supplied by the school. Therefore, Akif must allocated some time to search for it. Cemile's attempts, yet to be unsuccessful, to use Plickers® suggested that she desired to use the ICT applications that were introduced in the workshop. It could be claimed that before the lesson Cemile allocated some time for adjusting Plickers® program. (In

order to use Plickers®, one should prepare a class list and assign each student a number to match with a specific code card. In addition, teachers should prepare some questions together with their answers so that they could reflect on the board and ask to students.) Cemile and Cihan claimed that they prepared the PowerPoint presentation themselves. Since making PowerPoint slides is a time-consuming activity, both teachers obviously made their time before the lesson in order to use ICT in their classrooms.

Ersoy, Canan, and Mahmut seemed they did not do preparation for ICT use. During the class, Ersoy attempted to search for a related visual in web for introduction of the word tradition (*adet*). He typed the word in search engine on the interactive whiteboard. Then the search engine brought visuals related to menstrual pain (*adet sancısı*). Ersoy responded the undesired search result as he typed the synonym of the word "adet" and searched again. This might suggest that Ersoy did not spend some time before the lesson in order to plan for the material to be used in the class. Canan and Mahmut used the pdf of the textbook, which was among the school resources to project on the interactive whiteboard. This use of ICT obviously does not require either searching for materials or preparing them. Therefore, both seemed that they did not spend time planning for ICT use before the class.

4.3.3 The perception of online forum

The aim of this study is to examine factors that affect participation in an online follow-up forum. As the kind of platform changes, the factors that affect participation might change. Therefore, it was beneficial to explore teachers' perceptions about the online follow-up forum and to explain to them the exact design, in case their perceptions were different from the researcher's perception. The

perception of the online forum depicts the online forum image, which was illustrated by teachers' verbal communications.

Out of six teachers, only Cihan and Mahmut supplied their perceptions about the online follow-up forum. Cihan, who never logged into the platform, explained that she did not remember it very well and conveyed her image of online follow-up forum tentatively. It is evident from her use of expressions such as "I guess" and approval seeking questions such as "Do I remember wrong?" while she was describing the platform. Akif explained another online forum that the school had created for teachers when he was asked to describe the online follow-up forum that was created by the ICT PD team. Even though he logged into the online follow-up forum twice, once on workshop day again before the lesson observation, his reference to another online forum was interesting. Even though his explanation belonged to another online platform, his explanations were included in this section, too. Canan and Cemile logged into the online follow-up forum once, but they stated that they did not remember the forum at all. Ersoy, who had never participated in the forum, was also unable to remember the platform. This shows that most of the teachers did not have a sound recollection about the online follow-up platform.

Three teachers' descriptions reflected two different aims of the forum: either teachers' exchange of knowledge and materials or supplying teachers with knowledge or materials. They may seem similar, but the direction of the information flow is different in these goals. Exchange of knowledge allows contribution to the forum by the teachers, but reaching at knowledge requires only the forum director to post in the platform.

Even though all three teachers associated the online follow-up forum with information sharing, only Cihan portrayed a forum image as the continuance of the

workshop. Therefore, it was seen that teachers did not have the same understanding of the online follow-up forum as the same as the researcher had.

Akif reported that the aim of the forum was teachers' exchange of knowledge, especially educational materials. In addition to sharing materials, improving the effectiveness of these materials via critiques of other teachers was another aim that he stated. This explanation did not involve any mention of the workshop. Akif's examples of the kinds of educational materials to be shared also revealed that he did not perceive the forum as a follow-up to the ICT workshop because his examples did not involve ICT use:

> For example, when we are doing a classroom activity about the creation of the world or movements of the earth, we say that there are two kinds of movement of the earth. We explain that the fact that it [Earth] is tilted to 23.5 degrees is not emphasized or even included in textbooks. For example, [the relationship between] the occurrence of the seasons [and] axial tilt was not included [in the textbook]. For example, I directly shared this. They said that "yes the textbooks do not include it but we can share it". Then little earth models, placing four of them around the sun [model], in the following way: close, close, remote, remote. The ones who revolve closer [to the sun model] is spring summer, when it became distant the concepts of fall and winter was emphasized, together with [the concepts of day and night]. (Appendix N, 1)

Cihan also reported that she perceived the forum as a place to share information and documents and to communicate with other teachers. When she was asked about what could be shared there, she listed different materials such as educational tasks and the materials that were required by the PD team, and she explained these documents as:

> Well for example we received training about drama. For example, in drama training, they [instructors] asked us to read a poem aloud [and record our reading]. Then they would take it [the audio record] from us and they would listen to it in order to evaluate our diction. For example, how we could or could not read the poem. (Appendix N, 2)

However, she revealed that she was not sure about her explanation. Even though Cihan presented her perception tentatively, reference to the workshop, and especially

the products of their practice, indicated an insight about the continuance of the workshop.

Mahmut, who logged in more than once and stated that he made use of the posted materials, described the forum as a place mostly for sharing educational materials such as videos that illustrate effective classroom teaching and learning situations. He stated that only the forum director was responsible for posting those educational materials. When Mahmut was probed to comment about the online follow-up forum in terms of getting support, he claimed that there was no support. Then he advised a specific support link where teachers would be able to post their problems they faced when they were practicing the ICT application and would be able to receive answers. Since he recommended this support mechanism as if it did not exist in the forum, it was understood that Mahmut did not perceive the forum as a follow-up activity for the workshop.

Teachers reflected different perceptions of the forum users. Akif might have thought that every teacher working in any branch of the school was a member of the forum. He said, “For example, I can use an application which my colleague performs in the next classroom. I can use it in an hour or maybe on the following day. This results in information exchange between colleagues” (Appendix N, 3). From Akif’s school, only three teachers participated in the workshop and none of them were using his next class, as witnessed by the researcher during the class observation. Therefore, referring to the teacher in the next classroom as a participant in the forum might indicate that Akif perceived that forum users were assigned not only from the workshop group but also from the whole institution. This kind of membership which is open to each teacher reveals a lack of awareness that workshop attendance was a

precondition for enrolling in the forum. Therefore, this might also suggest that Akif did not perceive the online follow-up forum as the continuance of the workshop.

Cihan explicitly stated that teachers who came to the workshop are the forum members. This explanation also reflected that Cihan perceived the forum unique to workshop attenders.

Mahmut demonstrated having unclear knowledge about who could participate in the forum. He asked, "You introduced us [the ICT applications], we know how to use them, but apart from that in terms of other people's learning, assume that someone want to join the forum, for example, will it be open to outsiders?" (Appendix N, 4). This question suggests that Mahmut considered the possibility that other teachers who did not participate in the workshop would also participate in the forum. Also, while he was discussing the dangers of mutual posting among teachers, Mahmut stated that:

> The risk [of occurrence of negative posts] may increase when there exists people we do not know. There might be fewer problems with the people you know because you have to be together with them at least. And everyone would participate without meeting each other because this [the online forum] is a [online] platform. (Appendix N, 5)

This reference to people that he did not know suggests that he was unaware that only teachers from his workshop group constituted the online follow-up forum.

In sum, teachers either did not have any understanding of the online follow-up forum, or they conveyed perceptions of online forums which were distinct from the researcher's perception. These perceptions were different not only from a follow-up platform but also from each other. Only Cihan's description of the online follow-up forum was rather close to that of the researcher. However, she reflected hesitation during explanation due to her blurred memory about the forum.

4.3.4 The factors affecting participation in the online follow-up forum

The interviews signaled five themes about the factors related to online participation. Those include a need for ICT applications, reactions to problems, training for the forum use, others' posts, and lack of time. These factors were, all together, responsible for the participation. The definitions of each theme are represented in Table 11.

Table 11. The Definitions of the Themes

Theme	Definition
Need for ICT applications	Conditions which impel teachers to use the ICT applications which were introduced during the workshop.
Reaction to problems	Teachers' respond when they have a difficulty while they are using an ICT tool.
Training for the forum use	A process of getting familiar with the online follow-up forum and obtaining necessary skills to be able to use it.
Others' posts	Posted messages of the other forum members.
Lack of time	Teachers' having inadequate time to practice the ICT applications themselves.

4.3.4.1 Need for ICT applications

The first theme from the findings relates to teachers' perceived need for using ICT applications that were introduced during the workshop, including the online follow-up forum. The underlying goal of the online follow-up forum was to assist teachers in overcoming potential difficulties in using the ICT applications. It was expected that they would not come to the online follow-up forum if they did not use the ICT applications. Ersoy summed this up when he said, "well when [a teacher] needs it

[the online forum], if s/he uses [the ICT applications]; if s/he has difficulty when s/he uses [the ICT applications]" (Appendix N, 6)

Several teachers reported that they would use the ICT applications if they find them necessary. There are two main triggers for using both the ICT applications and the online-follow-up forum: being open to self-improvement and being pushed by the school administration or the PD staff.

Ersoy explicitly indicated the effect of self-improvement on using the online follow-up forum by saying, "This [the online forum] would not be a necessity for a teacher if s/he does not consider what to improve and how to improve it in her/his classroom" (Appendix N, 7). Similarly, when asked about the reasons for non-participation of others in the online follow-up forum, Mahmut replied, "This is a little bit related to a teacher's being open to self-improvement. It means that they are not open to improvement that much" (Appendix N, 8) and Cemile replied, "If you are interested, you use it more, if you do not have any interest you do not want to use it … interest for self-improvement" (Appendix N, 9).

Canan indicated the role of school administration in reinforcing the use of the ICT applications by illustrating two distinct attitudes she demonstrated towards Excel use. She seemed not to practice what she had learned from the workshop about Excel as she explained, "anyhow, I do not have anything to do with Excel, so you have thrown it to the trash bin, from there it has gone to waste" (Appendix N, 10). This trash metaphor strengthens her expression that she would not make use of the Excel presentation anymore. Therefore, it might be deduced that Canan's foresight about future use of Excel determined her attitude towards practicing what she was introduced in the workshop. However, her attitudes towards practicing Excel seemed to be completely changed after the school administration required that the

administrative documents should be submitted via Excel. She revealed, “well, I try to practice as long as I am free because we will presumably use it [Excel] from now on, and I have to learn [how to use Excel]” (Appendix N, 11). This feeling of obligation might have created a need and out of this need, Julide likely practiced the application in her free time, unlike what she did after the workshop. Cemile contributed further to the importance of school enforcement on participating in the online follow-up forum when she stated that “if it [the online forum] was mandatory in the school, I think that it would be definitely used [by teachers]” (Appendix N, 12).

Cihan pointed out the importance of the type of PD program in terms of enforcement of ICT applications when she advised a blended PD program. In this blended program, she suggested that teachers meet with the PD team a few times and the PD team would assign some coursework that requires the practice of the ICT apps. This kind of PD program would require teachers to face the PD team repeatedly and this encountering might trigger an obligation to practice the ICT apps. She stated, “since I would use it again whenever I met you, I would need to learn it or I would need to learn it to use it in other things [for assignments], there [at the following meetings] I could use it again” (Appendix N, 13).

Some teachers proposed two barriers to the use of the ICT applications: having alternatives to the ICT applications and lack of computing competence. For example, Julide stated that the school policy did not allow teachers to use the ICT applications other than school sources and she did not question this restriction because they already had enough alternatives to those ICT applications in their own program. Ersoy claimed that instead of ICT applications, using paper and pen was easier for some teachers, so they preferred them instead of ICT tools. Cihan contributed further:

> I generally create a class list [or] call report but I do not need to use Excel much because my job has nothing to do with Excel. If it is necessary to use [Excel], then I create a table on Microsoft Word® because I do not know how [to use] Excel. (Appendix N, 14)

In this example, Word constituted an alternative to Excel if the aim was creating a table.

Mahmut claimed that teachers do not want to do anything when they do not have sufficient computing skills. He gave an illustration from his own experience, recalling that during a school meeting he learned that there were teachers who did not know how to use Excel. He explained that at the end of the meeting, the school administrator asked teachers to prepare an Excel document about the meeting and send it to the school headmaster, and one of the teachers revealed that s/he did not know how to use Excel. Referring to this example, Mahmut compared the ICT apps to Excel and claimed that, for teachers who do not know how to use Excel, using the ICT apps is unachievable.

In sum, teachers were likely to participate in the online follow-up forum if they felt a need to use the ICT apps or if the school administration obliged teachers to participate. The need for using the applications resulted from either self-improvement desires or enforcement by an external agent such as the school.

All teachers who reported that they used at least one of the ICT applications logged into the forum at least once. However, Ersoy did not logged into the forum at all, even though he reported that he used Plickers (one of the ICT apps that were presented in the workshop). This suggests that using the ICT applications did not guarantee participation in the online-follow-up forum. Ersoy asserted that teachers might participate in the online forum if they faced a problem when using the ICT apps. However, Cemile and Canan challenged this claim because they reported that

even if they attempted to use some of the ICT applications, they did not recall online follow-up forum when they faced with problems.

4.3.4.2 Reaction to problems

The second theme is teachers' different strategies to overcome problems that they faced while they were using the ICT apps and how that affects online participation. The interviews suggested that facing problems led to two main types of reactions: avoidance and action. Avoidance refers to the act of setting aside, while action refers to searching for a solution. In acting on the problem, four main activities were deduced according to the interviews: searching on Google, asking someone more knowledgeable, trial and error, and participating in the forum.

Cemile exhibited avoidance behavior when she attempted to use Plickers in her class. She explained that she worked hard at home to prepare questions in Plickers® and when she tried to use it in the classroom, the interactive whiteboard did not work. Then she summed up her reaction to this problematic situation saying, "I gave up then." This implied avoidance behavior. When she was asked about what could have been done to overcome this problem, she replied:

> Well, you know that in our schools there are Information Technologies (IT) teams. Maybe they could have taught [how to use the ICT applications] this way, and we could learn from them. However, well since they do not know anything right now. (Appendix N, 15)

Consulting an IT specialist might suggest that she tended to learn from more knowledgeable people, especially from the authorities in the field. Since the forum was intended to include only teachers, her solution strategy might have affected her participation negatively.

Ersoy was one of the teachers who demonstrated googling activity. He described how he handles problems: "For example, when I find something, when I

need a solution, I can find solutions when I search on Google®" (Appendix N, 16). In another part of the interview, he said, "I generally ask questions on a search engine. I do not even ask someone else, I turn the trick via a search engine" (Appendix N, 17).

Canan is another teacher who reacted to problems with certain solution techniques. She illustrated her action to deal with a problem she faced using Excel:

> For example, last day I was alone at home. Firstly, I typed 'widening rows' on Google®. I said I would work out it this time. There [appeared] certain instructions, no, it did not work. Then, from another web page, another thing, did not work. Then I texted a friend of mine who knows it. S/he said something. Well, finally, I copied it [part of a written text] in case it got deleted I would have another copy of it in my hand. I finally found out [how to widen rows on Excel] while I was clicking here and there at cross purposes. (Appendix N, 18)

Like Ersoy, Julide firstly resorted to Google®. When the Google® search did not work, she consulted a friend. When this strategy also failed, she referred to trial and error, which reflects self-learning. This order might reflect a hierarchy in teachers' preferences about the solution method. Being alone might have pushed Canan to Google search, which demonstrated a self-learning strategy and failing in each solution attempt might resulted in changing solution strategy from more convenient to less. Ersoy explained the matter of convenience more explicitly. After he presented his own problem-solving method, he compared his strategy with other teachers' by saying, "When you think like others, people generally, as the easiest way to find [solution] is scanning on search engines, to my surprise they even do not that but ask to people around them" (Appendix N, 19). Ersoy found his way of solving-problem as the easiest methods among others'.

Mahmut was another teacher who reported that he used one of the ICT applications. When asked whether he had any problems using it, he replied that he had, but he overcame the problem by trial and error. Then Mahmut was asked

whether other teachers were able to help him to solve his problem, he had no expectation from his colleagues in terms of technological support:

> If there is someone who would answer [to my problem], it would be technical service. If my friend in technical service team would say, because he might have more knowledge about computer than me. Or else, when there are people who are interested in informatics, then there appear no difficulties. I, myself, already try to learn about this area from the people who are close to informatics often. I always keep in contact with the computer teachers with whom I worked in my previous schools. (Appendix N, 20)

Like Cemile, Mahmut indicated technical service as a support source. However, he explicitly recalled that teachers in his school were not able to help him in issues related to ICT use. He took no account of his colleagues and instead consulted individuals who are specialists in technology such as technical service and computer teachers. This explanation showed that Mahmut resorted not only to a trial and error strategy but also to the method of asking others, especially specialists.

With the exception of Ersoy, none of the teachers uttered the online follow-up forum to solve problems without directly being asked. During the interview, Ersoy spontaneously stated that he does not prefer to post questions on online forums, including the follow-up forum. He discussed that expecting answers from other forum users put him in an uncontrolled situation in which he would give a break to whatever he was working on and wait for the answer to come, if it ever did. After being probed by the researcher, Cemile and Canan revealed that they did not make use of the forum because they did not remember it existed. Both teachers stated that at first, they logged in and got excited about the forum, but later on they did not continue their participation. This suggests that participating at least once does not guarantee continuation in the online follow-up forum.

In the way of frequent participation in the online follow-up forum, adopting a habit of using the forum was a repeated theme from the interviews. Canan explained

this clearly: “Once it becomes a habit for people, then [they] would always take a look at [the online forum] again and again” (Appendix N, 21). Ersoy also related recalling the forum to the habit of forum use and claimed, “Again, if a person tends to log into the online forum. Well, since everyone’s aim to use Internet is different. Well, to tell the truth being a forum user is not something everyone does” (Appendix N, 22). Cihan gave a concrete example of Ersoy’s claim, as she explained her expectation from forum content:

> … event oriented, there could be also their announcement or there could be sharing about the conducted practices. They are the things that I am interested in and search [on the Internet] when I use Internet. Apart from this I do not use it a lot. (Appendix N, 23)

In adopting a habit of forum use, some teachers recommended using the forum with other teachers at the same time during the workshop. For example, Akif said, “we should practice two to three class hours in order for us to get used to it” (Appendix N, 24). Similarly, Cihan stated that “the things that are not continuous do not become a habit,” (Appendix N, 25) and advised that “it [the online forum] would be more active if we could have logged in [the online forum] and used it in addition to the other ICT applications” (Appendix N, 26).

In brief, not all teachers were eager to solve problems that they faced when using an ICT app. In addition, if they were determined to solve problems, teachers followed different ways. Some preferred to reach an answer via search engines, some used trial and error, some asked for help from specialists. However, asking help from their colleagues was not among the most uttered solution techniques. Since the online follow-up forum was based on this unrecalled method, their reactions to the problems likely to affect participation in the forum.

4.3.4.3 Training for the forum use

A third theme that emerged from the research was training for forum use. Cihan explicitly pointed out the importance of getting familiar with the forum when she stated that "I know what a forum is but I did not log in because I do not know how to use it" (Appendix N, 27).

When teachers were asked if training was necessary in order to learn how to use the forum, teachers were divided. Ersoy and Canan suggested that training was not necessary for using the platform. However, Ersoy advised designing a forum platform so that the aim, the content, the participants, and the participants' roles were obvious so that it would be possible to use the forum correctly. He found the online follow-up forum quite unclear.

Other teachers found the idea of training about the online follow-up forum useful. Even though Akif found the online follow-up as easy to use, he suggested that training would help teachers to upload materials and change settings of various features. Akif explained the easiness of the online platform by comparing it to other platforms such as WhatsApp® and Facebook® in terms of posting messages. Similarly, Cemile claimed that training would help, especially for teachers who are not familiar with computers. In addition, she stated that training would help teachers to post their questions in a better way. Mahmut also supported the idea of training and illustrated the aim and content of the training with an example: "In any link, for example, instruction of Turkish reading and writing, there should be content of [the link]: its being a video, together with, how to use it when you open the link" (Appendix N, 28)

A lecture-based presentation of the online platform which was given during the workshops was not effective in creating a true understanding of the online

follow-up forum. Mahmut claimed that it was not mentioned during the workshop and advised presenting the forum using visual presentation even though the instructor announced the forum in each workshop group. Akif stated, “In order for me to learn it, even though you explained it to me ten times, when I leave [the workshop] I forget it right away” (Appendix N, 29). Ersoy said, “The explanation you made during the workshop is not on my mind” (Appendix N, 30). Cihan contributed further:

> … for example, did we log in this platform on that day [the workshop day]? It [the presentation of the online forum] stayed only as oral, right? Since it stayed oral, maybe that is why it did not have much functionality for us. (Appendix N, 31)

Teachers who supported training stated that in order to get familiar with the platform, they should learn it by doing. Akif described an effective training based on practice:

> … for example, [teachers] would come with their computers, we have already created the system, then we would open it and write to each other there, on the platform where we are. You would write me, I would write you. This way, the person sitting next to me would write in here [the online forum], then I would upload something [if it is necessary]. Then we would discuss about my post via writing to each other. (Appendix N, 32)

Cihan also suggested that “it [the online forum] would have been more active if we could have logged in [the online forum] and used it in addition to the other ICT applications” (Appendix N, 32). Cemile stated that she remembered only the Plickers® application about the workshop but did not recall the online follow-up forum. When she was asked why Plickers® was catchier, she claimed that the presentation of the ICT apps was visual and fun. As she proposed the visual and fun features of the presentation of the ICT apps as the reason for remembering them easily, she might have indicated that the presentation of the online follow-up forum, which was based only on verbal explanation, made it difficult to attract teachers’ attention. Cemile did not explicitly propose a practiced-based training, but the

activity that she referred as fun and visual included patterns of active learning. In order to introduce Plickers® to teachers, the instructor simulated a classroom situation in which teachers role-played as students and the instructor as the teacher. Teachers were asked a simple mathematics problem and then they were requested to hold their Plickers® cards with their answer upright at the top of the card so that instructor could use Plickers® mobile app to scan their answers and reflect on the board. During this activity, teachers did not use Plickers®, but role-playing kept them active.

4.3.4.4 Others' posts

A fourth theme that emerged from the research was others' posts. These posts had the potential either to increase the number of log in or to prevent teachers from posting on the forum.

The online follow-up forum was designed so that teachers could supply each other useful information about the proper use of the ICT apps. Since the knowledge source was thought to be teachers, the PD team expected that the forum would function with teachers' contribution. However, interviews suggested that in order to participate continuously, teachers expected to see posts of others when they first participated in the forum. When teachers were asked what kind of posts they would expect from others to share, they all described a forum with richer content and involving direct links to several information sources such as library web pages. Another thing they pointed out was that the content should be related to pedagogical and content knowledge. The following examples demonstrated this:

> There could be useful information. For example, if there were documents related to first grade, second grade, or any grade, I would definitely log in, I guess. For example, for teachers of third graders it could be something such as how to teach a subject. This kind [of posts]. (Cemile, Appendix N, 33)

> If it is intended to draw teachers in the platform, then it could be related to teachers teaching [a subject]. Primarily, it could be this … among the activities which teachers conducted in their own classes, the favorable, successful, ones could be posted there. (Mahmut, Appendix N, 34)

Ersoy also contributed further, saying, "For example, when I find something which could ease my lesson every time I log in, because I really look for this kind of thing" (Appendix N, 35).

Then teachers were probed to explain whether they expected only the instructors to post in the forum. Except for Mahmut, other teachers disagreed and suggested that both the instructor and the teachers could post on the forum. Cemile explained:

> No, well, teachers should also post but I might have discontinued because I could not see anything at my first sight, maybe because it was an unused web site. If something was posted at the beginning, then maybe it would attract my attention much more. (Appendix N, 36)

Cemile related her interest in the forum to existing posts. Akif added, "I have to write to people that stayed there and I was connected [online] at that moment [during the workshop]. Thus, the system could function" (Appendix N, 37). Akif associated the functionality of the online follow-up forum with interactive posting. Since interactive posting requires others' posting, Akif might had indicated others posting as an indication of a functional forum. Similarly, Canan explicitly indicated her expectation that the administrator of the forum should start posting first: "When the forum admin starts it [posting], then somehow this way you already know about it" (Appendix N, 38). Ersoy also emphasized that "when everyone posts something, when it becomes a place for everyone to share, when this perception is created, then it does not have to be that way [the forum admin would not have to post on the forum]" (Appendix N, 39). The word *everyone* included a reference to other users, so Ersoy demonstrated an expectation from other users to post on the forum.

When teachers were asked if they believed that other forum users could have helped them solve their problems, they generally answered with a conditional. For example, Cemile stated that other forum users might have helped her solve problems if they used the online forum. This conditional "if" includes the possibility of non-participation by others. Canan replied:

> If I can find an answer [to my questions] there, it already becomes a platform for me to stay in. If not, I mean, one of my questions and my next question is not responded there, then I do not even ask a third question there. (Appendix N, 40)

The conditional in this answer includes the possibility of not getting help from others. Similarly, Cihan pointed out that having support from others was possible only with the participation of experienced and sharing forum users who had positive attitudes towards the forum by saying that "if someone perceives that platform as useful, and if someone has certain experiences, then with a sharing person I can find an answer [to my question]" (Appendix N, 41). Thus, it is obvious that teachers do not have clear-cut beliefs about getting help from other teachers. Instead, most of them based their beliefs on other teachers' activities in the online forum.

Four teachers mentioned some potential negative consequences of posting in general. Yet all of them except Mahmut added that this would not be likely in the online follow-up forum. Even though they claimed that these undesired posts would not occur on the current forum, the fact that they had brought up the issue made it worth pondering. Among those worries, Canan repeatedly mentioned teachers' harsh comments about each others' teaching styles. Mahmut reported that it was not guaranteed that some teachers might sabotage others with their posts. Akif added: "it is mostly unthinkable for the qualified people like us to use it for different purposes" (Appendix N, 42). He exemplified a misuse as "I do not intend to declare something

private there. For instance, I went to x place together with Ahmet, or Ersoy" (Appendix N, 43). Cihan stated:

> If I know that it is safe I would stay and post [on forum websites]. Well, in today's time, how to say, I do not know who, with which name, does what there [at forum websites]. Since [some] people are psychologically unstable, [and] there are unusual social relationships. (Appendix N, 44)

4.3.4.5 Lack of time

The last theme lack of time appeared related to two distinct topics. One of them is lack of time to use applications, the other one is inadequate time to participate in the forum. Cihan and Mahmut illustrated the first type of lack of time. When Cihan was probed to explain if time is related to use of ICT apps Cihan replied as:

> We can say [that it is related]. Since I come home, I stay alone. I guess, it might be different for others' lives but dinner time also [matters]. I come, then [lesson] planning for tomorrow, completing extra work if there is, homework, I give homework every day. Checking homework assignments and giving relevant feedback already end the night. Then again, time becomes inadequate at one point. (Appendix N, 45)

Unlike Cihan, Mahmut brought up the issue of lack of time spontaneously after the interviewer stated, "there must be some reasons that you did not use them" (Appendix N, 46). His answer was conflicting because at first, he stated that there was no reason. Then he added that it was laxness. At the end, he proposed workload, which stemmed from extra duties given by the administration as an underlying reason.

Akif and Cemile suggested lack of time as a possible reason for not participating in the forum. Like Mahmut, Akif also indicated the workload that based on extra duties given by the administration. In addition to this kind of workload, Cemile pointed out the desire to be with family or sparing time for oneself after with further probes during the interview.

Although teachers expressed lack of time as a reason for not using ICT apps and the forum, classroom observations of some teachers revealed another actor—educational beliefs. Although, the schools supplied teachers with educational materials to use in their classes, Cemile and Cihan did not use them during the observation. Instead, they used an activity which they planned themselves. Planning these materials obviously required extra time, and these teachers spent their time creating them instead of using the materials that were supplied by the school. Therefore, sparing time for planning specific educational materials did not stop these teachers from using them. When Cihan was asked why she spent her time to prepare that material instead of using the school resources, she replied:

> Because children are in the concrete operational stage, they are in the play stage. Therefore, if you combine something they like with something they do not like, you could make more permanent progress… for example, play dough is not only beneficial for children's hand-eye coordination due to shaping but also children participate actively in lessons [this way]. As I said before, this serves for learning permanently. In addition, children always have mobiles and tablets in their hands because they are in the age of technology. These are also attractive for them, and I just associate allurements with lesson subjects to be learned in the process. (Appendix N, 47)

In this answer, she demonstrated her educational belief. According to her, play dough activates students and technology attracts students' attention. She claimed that combining these attractive materials with the knowledge they are expected to learn would result in a permanent development, and she had prepared her lessons this way since she started to teach first graders. To the best knowledge of the researcher, the school supplies teachers only with paper and pencil activities. These kinds of activities do not involve attractive materials, so they do not seem to be congruent with Cihan's educational beliefs. Therefore, this conflict might push Cihan to prepare her own suitable material. This suggests that Cihan would likely to allocate her time trying novel educational methods if she believed that method could bring better

results in student learning. Thus, this example suggests that some teachers seek potential classroom use of ICT tools presented in the PD in order to spend time for preparing ICT material to use in their classroom practices.

CHAPTER 5

DISCUSSION, IMPLICATIONS, AND FUTURE RESEARCH

The study's investigation focused on primary school teachers' participation on an online platform which was set as a follow-up activity for an ICT PD workshop. The following research questions were examined:

1. To what extent can teacher demographic, teacher perceived workplace conditions and teachers' attitudes to ICT integration in education predict teachers' participation in the online forum?
2. How do teachers perceive the online forum?
3. What do teachers think are the factors that affect their participation in the online forum community?

In order to investigate these questions, this study asked primary school teachers who had enrolled in a PD workshop about ICT I education to fill out three surveys. The surveys included questions about teachers' demographic information, perceived workplace conditions, and attitudes towards ICT use in education, respectively.

The sample consisted of 89 primary school teachers who taught in different branches of the same institution and had self-selected to enroll in a PD workshop which was conducted with the collaboration of their school and a university. Both quantitative and qualitative data were collected and analyzed using descriptive statistics, a direct logistic regression, and the interpretation of patterns and themes.

5.1 Summary of research findings

Of 89 teachers, only 33 participated in the online follow-up forum. Teachers who logged into the online follow-up forum got higher scores from attitude and workplace condition scales than teachers who did not logged into the platform. The representation of the teachers with different demographics was similar for the whole group and the online follow-up forum participants. However, the frequency of certain groups of teachers weighed more in the participated group than in the whole group. Those were female teachers, teachers with 6-12 years of experience, teachers with an undergraduate degree, and teachers who had forum experience.

When a direct logistic regression was conducted, demographic variables and attitude scores did not predict a significant participation. However, teachers' perceived work place conditions and forum experience were significant predictors of participation in the online follow-up forum.

The qualitative findings of the study revealed dominant themes of what influenced teachers' participation in the online follow-up platform. Classroom observations and interviews helped to explain the ICT infrastructure and teachers' habits of ICT use in the classroom. All classes were equipped with interactive whiteboards that were connected to the Internet, and teachers stated that the physical conditions were not an obstacle to using ICT applications. During the lessons, each teacher made use of ICT for instructional delivery such as drills and practice and tutorial tools. In addition to instructional delivery, only the female teachers used ICT as a behavioral management tool. Teachers separated into two groups in terms of planning for ICT use. Three teachers used ICT materials which were not among the school sources. Therefore, they seemed to allocate some time to preparing for these materials and tools. Two of these teachers had experience between 1 and 5 years and

the other had teaching experience above 30 years. Others used school sources such as pdf versions of textbooks, which required no preparation for ICT use. Two of these teachers had teaching experience above 30 years and the other had 1-5 years of teaching experience.

Interviews showed that among six teachers, three of them did not remember the online follow-up forum and the others' perception of the online follow-up forum were not aligned with the idea of a follow-up activity. Only one teacher described her understanding of the forum which was very close to the aim of the follow-up for the workshop, but she seemed unsure about her explanations.

Five main factors that affect online participation emerged from the interview transcripts. These factors are need for ICT applications, teachers' reactions when faced with ICT-related problems, training for the forum use, others' posts on the forum, and lack of time. The qualitative data analysis revealed that teachers use ICT applications, including online follow-up forum, if they feel a need for using them. This need is triggered either by teachers' self-improvement tendencies or by enforcement of an external agent such as the school administration. Even if some teachers used the ICT applications and faced a problem, this did not guarantee they would use online forum to solve their problem. Teachers resorted to diverse ways of solving their ICT-related problems. Among these ways were googling, asking someone more knowledgeable, and trial and error. However, only one teacher indicated online follow-up forum, but he also stated that he did not prefer to use it to solve a problem.

Teachers mostly agreed that a practice-based training for forum use is necessary, both for getting familiar with the platform and to acquire a forum habit. Another factor that influenced online participation was others' posts. Teachers stated

that they expected to see postings on the forum when they first logged in. They indicated these postings as necessary for them to continue their participation. Also, existing posts supply teachers with information about other users so that they can judge the forum as a safe and beneficial environment. Lastly, most of the teachers claimed that lack of time is a factor for not using the forum and the ICT applications. However, classroom observation showed that some teachers allocated time for ICT use even though the school did not force them to do that.

5.2 Discussion

In this section, the result of the quantitative and the qualitative phase of the study are discussed together. The result of the quantitative phase is discussed based on both the results of the qualitative phase of the study and the related literature.

5.2.1 Low participation

The number of teachers who logged into the online follow-up forum was quite low: 37% of the whole group. This undesirable picture is not unique in the literature, and this situation seems more frequent in the online discussion platforms of PD programs in which teachers' participation is not compulsory, as in the current study (e.g., Owston et al., 2008; Stephens & Hartmann, 2004). On the other hand, structured online forums which require teachers' participation have more participants (Chen et al., 2009; King, 2002; Vonderwell & Zachariah, 2005; Yang & Liu, 2004). Online forums were structured either through the instructor's assignment of specific discussion topics each week or participants' obligation to lead discussions in turn. Either this structure or the difference in flexibility of participation to online forums might bring the disparity between the numbers of online participants. Owston et al.

(2008) attributed the number of participants in online PD forums to the flexibility of the participation to online discussions. Similarly, some interviewees in the current study verified the effect of obligation on the use of the online follow-up forum in their statements. Therefore, enforcement of online participation by an external agent might affect the number of participants in online forums which are designed to facilitate teachers' professional development.

5.2.2 Perceived workplace conditions as a predictor of online participation

The result of the direct logistic regression showed that the perception of positive workplace conditions is one of the significant predictors of online participation. There are several studies which emphasize school culture as an important factor in teachers' use of ICT in classes (e.g., Eteokleous, 2008; Sørebø, Halvari, Gulli, and Kristiansen, 2009; Tezci, 2011; Wong, Li, Choi, & Lee, 2008). There are also studies examining teachers' online participation in asynchronous discussions, and they mostly focused on design-based factors which are related to online participation (Coomey & Stephenson, 2001; Tsiotakis & Jimoyiannis, 2016; Vonderwell & Zachariah, 2005). However, to the researcher's best knowledge, there are not many studies which examine the effect of perceived workplace conditions on teachers' participation in online communities. Lock (2006) mentioned the school culture as a barrier to online communities, considering existing educational structures, teachers' busy schedules and competing educational priorities in the school. Vavasseur and Kim MacGregor (2008) focused on the positive effect of school principals' participation in online teacher communities. In the current study, not only school leadership but also the relationship between teachers and teacher autonomy were taken into consideration with a holistic approach in order to examine the relationship

between teachers' perceived workplace conditions and online participation. Therefore, this result has a potential contribution to the existing literature.

The qualitative findings of the current study shed light on why workplace conditions are important for online participation. First of all, perceived autonomy seems to have an effect. Most of the teachers reported during the interviews that the school administration does not interfere with their teaching methods. Therefore, they seemed to feel free to use any ICT tool in their classrooms. If they did not feel autonomous in their classrooms, they would not be able to use the ICT applications which they had learned from the workshop. In addition, this obstacle would prevent teachers from continuing their learning via the forum because the online follow-up forum participation requires an intention to use ICT applications. As opposed to this scenario, among five autonomous teachers, three of them participated in the forum. This finding corroborates the study conducted by Sørebø, Halvari, Gulli, and Kristiansen (2009) in which college teachers' perceived autonomy influenced teachers' intention to continue using e-learning tools in their classes.

Secondly, school leadership can explain the predictive role of the workplace condition on the online participation through its role on creating a need for ICT use. As mentioned above, participation in an online follow-up forum requires an intention to use the ICT applications. Interview data suggested that teachers intended to use the ICT applications if they felt a necessity to use them. Interviewees who had higher scores on the perceived school leadership scale reported using some of the ICT applications, while lower scores coincided with non-use. This difference suggests that the ICT applications become a part of teachers practice mostly under the school leadership. Interviewees who did not use the ICT applications explicitly proposed that if the school or the PD team obliged them to use the applications, their attitude

would be different towards the ICT applications, including the online follow-up forum. This finding is supported by the technology acceptance model which was developed by Davis, Bagozzi, and Warshaw (1989). According to this model, people intend to use computers if they find a value in using them. The value of the online follow-up forum might result from the link between the forum content and teachers' practices because prior findings showed that the participation in online platforms increases as PD becomes more relevant to teachers' local practice (Owston et al., 2008; Thorpe & Gordon, 2012; Vrasidas & Zembylas, 2004). Therefore, perception of strong leadership for the use of ICT tools might be effective in predicting online participation.

Moreover, workplace conditions might predict online participation via relationships between teachers. Teachers' worries about others' posts might prevent some teachers from participating in the forum. Most of the interviewees explained that it is possible that some teachers' posts result in undesirable consequences such as harsh criticism. Mentioning about the possibility of this kind of negative post indicates lack of group rapport, which is said to be important in the creation of a learning community (DeSanctis, Fayard, Roach, & Jiang, 2003; Farooq et al., 2009; Hur & Brush, 2009; Prestige, 2010; Tseng & Kuo, 2014;). In addition, the fact that teachers expected to see others' posts before posting on the forum points out the importance of group rapport because existing posts may supply teachers with enough information to observe others and to judge the trustworthiness of the online environment. Therefore, faculty trust might have an impact in explaining the predictive power of workplace conditions on online participation.

5.2.3 Forum experience as a predictor of online participation

Forum experience was the other significant predictor of online participation. This finding is similar to related research that has found that prior knowledge and experience in online discussions increase the online participation (Prestige, 2010; Yang & Liu, 2004). Qualitative data indicated two factors in explaining the link between forum experience and the online participation.

First, forum experience might lead to online participation because it is an indicator of a habit of forum use upon facing a problem. Learner centered environments are based on questioning, which results from puzzlement (Sloffer et al. as cited in Coomey & Stephenson, 2001, 1999). In addition, some studies propose teachers' self-directed learning skills as an important factor in online participation (Chen et al., 2009; Yang & Liu, 2004). However, interview data showed that self-directed learning skills and questioning does not guarantee online participation. According to the qualitative data of the current study, teachers' problem-solving habits were found to be important for online participation. Even though most of the interviewees demonstrated self-learning strategies such as searching information by using general search engines, few of them stated that they follow forums to solve their problems. Similarly, Cheng (2015) found that teachers' information seeking behavior affected their use of educational portals, and he found that teachers generally used general search engines instead of specific portals. The importance of adopting a habit for specific platforms is also mentioned by Deng and Tavares (2013). They found that students engaged more in Facebook as a web-based learning environment compared to Moodle, and they proposed students' existing habits of using Facebook as one of the underlying factors for the difference. Therefore, if

teachers do not include the forum use in their to-do list, teachers are likely to bypass the online forum to solve their problems, despite their self-regulated learning skills.

In addition to problem-solving habits, forum experience might predict online participation through the online practices it requires. Participants use forums for three different reasons: getting information, listening to debates, and networking with others (Rojo & Ragsdale, 1997). In the current study, teachers were invited to the online follow-up forum primarily to share their ICT application practices. However, interview data suggested that teachers tend to receive information from the forum rather than exchange knowledge or comments with others. Most of the interviewees advised the researcher to add more instructional content into the forum. Thus, teachers' expectations indicated a forum content which is based on one-way knowledge transmission. This expectation might be explained by teachers' existing online practices. The number of teachers who reported prior forum experience only in reading (n = 26) is more than the number of posters (n = 19). However, among posters, 58% of them (n = 11) participated in the online forum, while 58% of the readers (n = 15) did not log in at all. Thus, it may be suggested that teachers with forum experience—especially in posting—participate more because their online practices are compatible with the online follow-up forum use.

Time might be one of the determinants of teachers' existing online practices. Compared to reading forum posts, knowledge sharing requires more time. In formal academic and instructor-monitored online platforms, participants need more time and effort to write properly (Deng and Tavares, 2013). In online databases, individuals make a choice between spending their own time and supporting group members, and participants generally avoid making contribution to the database (Cress, Barquero, Buder, & Hesse, 2005). Time concerns also may appear when Internet users search

for information for themselves. Thorpe and Gordon (2012) found that social workers expect to find "something useable within a very short time frame, with an attention span of a few minutes being typical" (p. 10). The time issue was also mentioned by the inteviewees in the current study. Teachers indicated lack of time as a barrier to online participation. This finding is parallel to the previous studies that examine factors which affect online participation (e.g. Guan, Tregonning, & Keenan, 2008; Owston et al., 2008; Yang & Liu, 2004).

Apart from online practices, teachers who have forum experience might have participated in the online forum due to their higher self-efficacy to use online forums. People intend to use computers if they find them easy to use (Davis, Bagozzi, & Warshaw, 1989). This may apply not only to computers but to any ICT tools. Studies found that the ability of participants to respond online is a factor of successful online classrooms (King, 2002; Tseng & Kuo, 2014). In the current study, interviewees' suggestion about training for forum use also points out a need to improve their skills and knowledge about forum use. Like these teachers, a number of studies also addressed the importance of supporting participants' specific forum skills such as communicating with peers (DeSanctis, Fayard, Roach, & Jiang, 2003; Oren, Mioduser, & Nachmias, 2002; Sanches & Hueros, 2010; Yang & Liu, 2004). Even though there existed a tutorial about the forum and its use on Moodle and the instructor did an oral presentation about the forum use during the workshop, interviewees seemed unaware of the existence of these efforts. They did not remember them and explicitly suggested practiced-based training for forum use, which is also found to be effective in a number of studies (DeSanctis, Fayard, Roach, & Jiang, 2003; Oren, Mioduser, & Nachmias, 2002; Tseng & Kuo, 2014). Since there was no practiced-based training, it is possible that there was a difference

between former forum users and novice users in terms of self-efficacy. Former experiences in forums might have given teachers these forum skills, so they might have been more open to participate in the forum.

5.2.4 Attitudes towards ICT in education as a predictor of online participation

It was interesting that attitudes towards ICT did not predict online participation. Previous findings demonstrated a link between attitudes towards ICT in education and teachers' ICT use in the classrooms (Drent & Meelissen, 2008; Inan & Lowther, 2010). Like ICT use in classrooms, participation in the online forum, which constitutes a PD activity, has the potential to contribute to student learning. Therefore, it was expected that teachers' attitudes towards ICT in education would predict online participation, too. However, this was not the case. This might result from the fact that teachers perceived ICT use for PD activities as different from educational ICT use. One of the teachers indicated this, explaining that he is opposed to ICT use in education, but at the same time he made use of Internet for his PD. Another explanation for this surprising result might be that teachers did not perceive the online forum as a beneficial activity for improving teaching and learning. According to the interviews, the majority of the teachers did not have a clear understanding of the online forum. Therefore, their lack of understanding about its potential might have precluded the effect of attitudes on online participation.

5.3 Implications

The aim of the follow-up activity was to provide teachers with an opportunity to talk about the difficulties or confusion they experienced in using the ICT applications that were introduced in the workshop. Without using these ICT applications, teachers

would not need a follow-up activity. This study showed that there are two ways to trigger a need for teachers to use the ICT applications: either to increase teachers' commitment or to enforce the use of these applications. Creating positive workplace conditions is important for increasing teacher commitment, while enforcement of specific ICT use requires leadership. Since the PD team cannot affect workplace conditions, it should undertake a leadership role and set the use of ICT tools as a compulsory part of the PD and should monitor their proper use.

Online discussions require collaboration among teachers. Even though teachers intend to use the ICT applications, without collaboration, online follow-up forum would not be used. In order to collaborate, teachers should have positive relationships. This again brings the issue of positive workplace conditions. If there are obstacles to a warm school culture, a follow-up activity such as an online discussion may not be successful even though teachers intend to use the ICT applications. Therefore, the PD team should facilitate a sense of community among workshop participants.

In addition to creating a need for ICT use, teachers should be given practiced-based training to participate in online follow-up forums. This way, teachers can obtain the necessary skills to discuss asynchronously and adopt a forum habit to solve their problems. DeSanctis, Fayard, Roach, & Jiang, 2003 suggested fostering a mindset of viewing the technology as a platform space for interaction. Practiced-based training has the potential to serve this aim by exposing teachers to interaction. Moreover, practiced-based training would help the instructor to set a positive online environment in which teachers post messages under the supervision of the instructor. This supervision can prevent undesirable consequences of interactive posting such as

harsh criticism. Practiced-based training can also supply teachers with a basis to contribute more on.

5.4 Limitations and future work

There are some limitations to this study. First of all, the result of the study cannot be generalized to all Turkish teachers. The qualitative part of the study, which is a phenomenology , obviously poses a problem to generalizability due to its nature. In addition, participants were selected by purposeful sampling, so the results of the quantitative part of the study cannot be generalized, either. In order to do that, future studies could use random sampling.

Secondly, the perceived workplace condition scale has the potential to yield biased results because the survey was not answered anonymously. In order to analyze the predictive role of teachers' perceived workplace condition scores on their online participation, teachers were asked to write their name on the scales. Since the scale included items about their institution, it is possible that some teachers believed that their answers could be accessed by their administrators. As Donaldson and Grant-Vallone (2002) claimed, this possibility might result in a self-report bias, which often threatens the validity of research conducted in business settings. Even though the study was conducted in the field of education, Donaldson and Grant-Vallone's (2002) claim about business settings could apply to the current study because it was conducted in a private school. In Turkish private schools, teachers work on a labor contract that is used in business settings, and contracts can be terminated by the administration.

The third limitation is related to measurement of online participation. Log reports of the Moodle were used to identify teachers who logged into the platform at

least once. Even though log reports demonstrate a difference between teachers in terms of online participation, the aim of the teachers who log into the forum is difficult to determine. There might be some participants who logged in out of curiosity about the platform and there might be some who logged in to continue their education. Therefore, this possibility should be taken into consideration. In future studies, the definition of online participation could be determined more strictly.

Finally, the time period to observe online participation was short due to time pressures of the study. Oren, Mioduser, and Nachmias (2002) claimed that members' participation in asynchronous work proceeds through differentiated stages separated in time. It begins with reading, continues with elaboration, production and delivery, and finishes with feedback supply or feedback recollection stages. Getting familiar with each other over time coincides with an increased number of interdependent postings (King, 2002). A community of practices has distinct configurations according to the stage it reaches, so differentiating a healthy development from an unhealthy one is difficult at the early stages of a design (Schwen & Hara, 2003). In the current study, online activities were followed for three months. Since different workshop groups were introduced to the online forum on different dates, the online participation of teachers was followed for two to three months. Even though the online participation was low at this period, it has potential to increase as the workshops continue.

APPENDIX A

DEMOGRAPHIC SURVEY (ENGLISH)

Teacher Survey

1.Gender:
( ) Male ( ) Female

2. Years of teaching experience:
( ) 1-5 ( ) 6 -12 ( ) 13-20 ( ) 21-30 ( ) 30 and above

3. Age:
( ) 30 and below ( ) 31 – 40 ( ) 41 – 50 ( ) 51 and above

4. Education:
( ) Upper-secondary ( ) Undergraduate ( ) Graduate (Master) ( ) PhD

5. Please indicate your computer competence
( ) Inadequate ( ) Average ( )Good ( )Very Good

6. Have you ever participated in an online forum?

( ) No ( ) Yes

If yes please indicate how you participated.
( ) I read the posted messages on the forum.
( ) I posted my comment on the forum.
( ) I asked question to the forum participants.

APPENDIX B

DEMOGRAPHIC SURVEY (TURKISH)

Öğretmen Anketi

1.Cinsiyetiniz:
( ) Erkek ( ) Kadın

2. Hizmet yılınız:
( ) 1-5 ( ) 6 -12 ( ) 13-20 ( ) 21-30 ( ) 30 üstü

3. Yaşınız: ( ) 30 ve altı ( ) 31 – 40 arası ( ) 41 – 50 arası ( ) 51 ve üzeri

4. Eğitim Durumunuz:
( ) Önlisans ( ) Lisans ( ) Yüksek Lisans ( ) Doktora

5. Bilgisayar kullanma yeterlilik durumunuzu belirtiniz
( ) Yetersiz ( )Orta ( )İyi ( )Çok İyi

6. Daha önce herhangi bir çevrimiçi forumda yer aldınız mı?

( ) Hayır ( ) Evet

Evet ise ne şekilde yer aldığınızı belirtiniz.
( ) Forumdaki mesajları okudum.
( ) Forumda yorum paylaştım.
( ) Forumdaki katılımcılara soru sordum.

APPENDIX C

PERCEIVED WORKPLACE CONDITIONS SCALE

(ENGLISH)

Items of the Perceptions of School leadership/culture Survey

Please indicate your ideas about school leadership and school culture in your institution

	Strongly disagree	somewhat disagree	somewhat agree	Strongly agree
The principal lets staff know what is expected				
The principal knows what kind of school he/she wants and communicated it to staff.				
The school administration's behavior toward the staff is supportive and encouraging				
Goals and prioritiesfor the school clear.				
The extent that the principal or school head helped you improve your teaching or solve an instructional or class management problem.				
In this school, staff members are recognized for job well done				
My principal enforces school rules for student conduct and backs me up when I need it				
The principal talks with me frequently about my instructional practices.				
The principal does a poor job of getting resources for this school.				
Teachers in this school evaluated fairly				
Great deal of cooperative effort among staff members				
Teachers participate in making most important educational decisions in this school				
Rules for student behavior consistently enforced by teachers in this school, even for students not in their classes.				
How much actual influence you think teachers have over determining discipline policy (A great deal).				
Necessary materials (e.g., textbooks, supplies,copy machine) available as needed by staff				

Items of the Perceptions of Teacher Autonomy and Discretion Survey

Please score the following statement between 1 and 6 suitable to your perception

	1 (None)	2	3	4	5	6 (A great deal)
At this school, how much control do you feel you have in your classroom over each of the following areas of your planning and teaching?						
Selecting content, topics, and skills to be taught						
Selecting teaching techniques						
Selecting textbooks and other instructional materials						
At this school, how much actual influence do you think teachers have over school policy in establishing curriculum?						
At this school, how much control do you feel you have in your classroom over disciplining students?						

APPENDIX D

PERCEIVED WORKPLACE CONDITIONS SCALE

(TURKISH)

Okul Kültürü ve Okul Yönetimine Yönelik Öğretmen Algısı Anket Soruları

Okul kültürü ve yönetimine yönelik görüşlerinizi belirtiniz.

	Hiç katılmıyorum	Katılmıyorum	Katılıyorum	Tamamen katılıyorum
Okul müdürü, personelinin kendilerinden ne beklenildiğini bilmesini sağlar				
Okul müdürü nasıl bir okul istediğini bilir ve bunu personeline açıklar.				
Okul yönetiminin personele karşı davranışı destekleyici ve teşvik edicidir.				
Okulun amaçları ve öncelikleri nettir.				
Okul müdürü, öğretimini geliştirmek, öğretim veya sınıf yönetimi ile ilgili bir problemini çözmek için öğretmenlere yardımcı olur.				
Bu okulda, öğretmenler yaptıkları iyi işler için takdir edilirler				
Okul müdürüm, öğrencilerin okul kurallarına uymasını sağlar ve ihtiyacım olduğunda beni destekler				
Okul müdürüm, öğretim tekniklerim hakkında benimle sık sık konuşur.				
Okul müdürüm okul için kaynak sağlama konusunda yetersiz çalışır.				
. Öğretmenler bu okulda adil olarak değerlendirilir.				
. Öğretmenler arasında hayli işbirliği vardır				
. Öğretmenler, bu okulda eğitimle ilgili en önemli karar alımlarına katılırlar.				
. Öğretmenler, öğrenci davranışlarına yönelik kuralları kendi sınıflarında olmayan öğrenciler için dahi uygularlar.				
. Öğretmenlerin disiplin politikaları kararlaştırılmasında etkilidirler.				
. Öğretmenler tarafından ihtiyaç duyulan gerekli materyaller (kitaplar, fotokopi makinası, araç-gereçler) kolay ulaşılabilir.				

Öğretmen Otonomisi ve Sağduyusuna Yönelik Öğretmen Algısı Anket Soruları

Aşağıdaki ifadeleri size uygun olacak şekilde 1-6 arası puanlandırınız

	1 (Hiç)	2	3	4	5	6 (Çok)
Bu okulda, aşağıdaki alanların planlaması ve öğretiminde, sınıf içi hâkimiyetinin ne kadar olduğunu hissediyorsun?						
. Konu, başlık ve öğretilecek becerilerin seçimi						
. Öğretim tekniklerinin seçimi						
. Ders kitabı ve diğer materyallerin seçimi						
. Bu okulda, müfredat geliştirme politikalarında öğretmenlerin fiili olarak ne kadar etkisi olduğunu düşünüyorsun?						
. Bu okulda, öğrencilerin disiplinini sağlamak konusunda öğretmenlerin sınıf içi hakimiyetinin ne kadar olduğunu hissediyorsun?						

APPENDIX E

ATTITUDES TOWARDS ICT IN EDUCATION SCALE

(ENGLISH)

Items of Attitudes Towards Ict In Education Survey

Please indicate your views about the ICT integration in education

	Strongly Disagree	Somewhat disagree	Somewhat agree	Strongly agree
I find ICT use beneficial in terms of reaching the goals of the curriculum				
ICT use in classrooms brings extra workload				
I believe that ICT use in classroom would improve teachers' success				
I believe that the lessons which are conducted with ICT attract students interest.				
I believe that ICT tools are expensive.				
ICT integration in education in our country is luxury.				
I believe that ICT integration in lessons is difficult.				
I think that use of ICT tools in lessons result in lose of time.				
I believe that ICT supported classroom practices ease learning.				
I would like to use audiovisual tools in my lessons.				
I think that ICT use in lessons improve students' achievement.				
I think that students would actively participate in the lesssons with ICT integration				
I think ICT would contribute significantly to the educational sciences.				
My ideal is that our students get ICT supported education.				
ICT is not suitable for our country.				
I believe that ICT improves the quality of education.				
I think that ICT is rival to teachers.				
I think that ICT use makes students passive.				
I believe that audiovisual tools enhance permanent learning.				
I think that it is difficult to benefit from ICT in crowded classrooms.				
I think that one of the biggest problem of our education system is that ICT is not used effectively in lessons.				
I think that all teachers should be frequently brought up to date about ICT.				
I do not need to get acquaint myself with application areas of ICT.				
I believe that ICT use is not necessary to meet the learning objectives.				
I like to use educational ICT tools in my lessons.				

I believe that lessons would be more efficient when affordances of ICT are given place in classrooms.				
I believe that ICT is not necessary for each subject area.				
I feel deprieved of ICT use since I started my teaching profession.				
I enjoy teaching through integrating ICT.				
I think that ICT is the source of confidence and courage for teachers.				
I think that ICT restricts teachers' creativity.				
I believe that ICT increases motivation in lessons.				
I believe that using ICT tools requires knowledge and skills.				
I believe that ICT applications are necessary for more effective teaching.				
I think that ICT use increases teachers' responsibilities.				
I think that one of the requirements of being a good teacher is using ICT effectively.				
I think that ICT restricts students' creativity.				
I believe that teachers should act authoritatively in classrooms while they are using ICT.				

APPENDIX F

ATTITUDES TOWARDS ICT IN EDUCATION SCALE

(TURKISH)

Eğitimde BİT Kullanımına Yönelik Öğretmen Tutumları Anket Soruları

Bilişim teknolojilerinin entegrasyonu hakkındaki görüşlerinizi belirtiniz:

	Hiç katılmıyorum	Katılmıyorum	Katılıyorum	Tamamen katılıyorum
BİT kullanımını, öğretim programlarının amacına ulaşması açısından yararlı görüyorum.				
BİT'in derste kullanımı fazladan iş yükü getiriyor.				
BİT'in derste kullanımının öğretmen başarısını artıracağını düşünüyorum.				
BİT ile gerçekleşen derslerin öğrencilerin ilgisini çekeceğini düşünüyorum.				
BİT eğitim araç ve gereçlerinin pahalı olduğunu düşünüyorum.				
BİT'in eğitimde kullanımı ülkemiz için lükstür.				
BİT'in derste kullanımının zor olduğunu düşünüyorum.				
BİT araç ve gereçlerinin derste kullanılmasının zaman kaybına neden olacağını düşünüyorum.				
BİT desteğinin öğrenmeyi kolaylaştırdığına inanıyorum.				
Derslerimde görsel-işitsel araçları kullanmak istiyorum.				
BİT'in derste kullanımının öğrencilerin başarısını artıracağını düşünüyorum.				
BİT'in kullanımı ile öğrencilerin derse aktif olarak katılacağını düşünüyorum.				
BİT'in eğitim bilimine önemli katkılar sağlayacağını düşünüyorum.				
Öğrencilerimizin bilgisayar destekli eğitim görmeleri idealimdir.				
Ülkemiz için BİT uygun değildir.				
BİT'in eğitim ve öğretimin kalitesini arttırdığına inanıyorum.				
BİT'in öğretmene bir rakip oluşturduğunu düşünüyorum.				
BİT kullanılmasının öğrenciyi pasifleştirdiğini düşünüyorum.				
Görsel-işitsel araçların öğrenmede kalıcılığı artırdığına inanıyorum.				
Kalabalık sınıflarda BİT'ten yararlanmanın zor olduğunu düşünüyorum.				
Eğitim sistemimizin en büyük sorunlarından birisinin de BİT'in etkin bir şekilde kullanılmaması olduğunu düşünüyorum.				
Bütün öğretmenlerin BİT konusunda sürekli bilgilendirilmesi gerektiğini düşünüyorum.				

BİT'in uygulama alanlarını tanımaya gerek duymuyorum.				
Öğretimin özel hedeflerinin gerçekleştirilmesinde, BİT'in kullanılmasının gerekli olmadığına inanıyorum.				
BİT ile ilgili eğitim araç ve gereçleri derslerimde kullanmayı seviyorum.				
BİT'in imkanlarına yer verildiğinde derslerin daha verimli olacağına inanıyorum				
BİT'in her çeşit ders için gerekli olmadığına inanıyorum.				
Öğretmenliğe başladığımdan bu yana, BİT kullanmamın eksikliğini hissediyorum.				
BİT yardımı ile ders işlemek benim için büyük zevktir.				
BİT'in öğretmenler için güven ve cesaret kaynağı olduğunu düşünüyorum.				
BİT'in öğretmenlerin yaratıcılığını sınırlandırdığını düşünüyorum.				
BİT'in derste motivasyonu yükselttiğine inanıyorum.				
BİT'in araç ve gereçlerini kullanmanın bilgi ve beceri gerektirdiğine inanıyorum.				
Öğretimin daha etkili olması için BİT uygulamalarının gerekli olduğuna inanıyorum.				
BİT kullanılmasının öğretmenin sorumluluğunu arttırdığını düşünüyorum.				
İyi bir öğretmen olabilmenin koşullarından birinin de BİT'i etkin bir şekilde kullanmak olduğunu düşünüyorum.				
BİT'in öğrencilerin yaratıcılığını sınırlandırdığını düşünüyorum.				
BİT kullanırken öğretmenin sınıfta otoriter rol alması gerektiğine inanıyorum.				

APPENDIX G

INFORMED CONSENT FORM (ENGLISH)

INFORMED CONSENT FORM
Institution: Boğaziçi University
Title of the Study: Teacher Engagement in Online Professional Development Follow-Up: The Role of the Workplace and ICT Familiarity
Study Director/Name of the Researcher: Serkan Özel, Canan Güneş
Address: Boğaziçi Üniversitesi, Kuzey Kampüs, ETA-B Binası, İlköğretim Bölümü Bebek/ İstanbul 34342
E-mail:
Mobile:

Dear Teacher,

Canan Güneş as the master student of the primary education program of the Institute for Graduate Studies in Social Sciences at Boğaziçi University conducts a scientific research project named as "Teacher Engagement in Online Professional Development Follow-Up". The goals of the project are to analyze primary school teachers' interactions in an online forum which was set as a follow-up activity for a professional development workshop, to identify the factors associated with teachers' interactions, and to examine the role of teachers' interactions on the frequency of teachers' educational ICT use. The necessary consents for the project were acquired from the school administration. We invite you to participate in our project to help us. We would like to inform you about the project before your decision. If you would like to participate in the project after you read this information, please marked the below option "I would like to participate".

If you accept to join this project, a private account for you to sign in the online forum will be created by the researcher. You would sign in the online forum through this account and password. The messages that you would post on the forum will be examined by the researcher in order to be analyzed. These messages would help us to understand what kind of interactions occur between teachers on the online forum. You will decide how often you will participate in the forum according to your wish.

Secondly, we will ask you to fill out a short demographic survey. Demographic survey includes questions about your age, gender, marital status, years of teaching experience, education, prior forum experiences, and computer competence. Moreover, we will ask you to

fill out a survey about school culture, school leadership, teacher autonomy and discretion. This survey includes 18 questions. We will ask you to fill out these surveys at the end of the workshop day. It takes approaximately 30 minutes to fill out these forms.

Lastly, teachers who will be chosen randomly among the participants of this project will be observed in their classrooms and a semi-structured interview about their ideas about the online forum will be conducted with them. The interview will be conducted in a quite room, individualy, and will be voice recorded.

This research is conducted scientifically and all information will remain strictly confidential. The usernames and passwords of the teachers will be kept in the computer of the researcher and will not be shared either with an institution or with an individual. Surveys and interview transcripts will be protected in a locked closet and will be destroyed at the end of the research.

Participation to this research is voluntary. If you participate, you have a right to withdraw your consent at any phase of the study without showing a reason. In this case, the surveys and interview transcripts which belong to you will be destroyed; and the messages that you post on the online forum will be erased. If you want to learn more about the research project, please contact Canan Güneş. (Address: Boğaziçi Üniversitesi, Kuzey Kampüs, ETA-B Binası, İlköğretim Bölümü Bebek/ İstanbul 34342).

If you accept to participate in this research project, please sign this form and send it back to us in a closed envelope.

I, (name of the participant) ....., read the above text and fully understand the aim and content of the research and the responsibilities I have voluntarily take. I had opportunity to ask questions about the research. I understand that I can withdraw from this research whenever I wish without stating any reason and in the case of withdrawl I will not expose to negative consequence.

Under these circumstances, I accept to participate in the current research deliberately, without any force.

I took a copy of the form / I do not want to take a copy of the form

Name of the Participant:.....
Signature:.....
Address (if possible Mobile, Fax):.....
.....
Date (day/month/year):...../...../.....

Name of the Researcher:.....
Signature:.....
Date (day/month/year)...../...../.....

APPENDIX H

INFORMED CONSENT FORM (TURKISH)

KATILIMCI BİLGİ ve ONAM FORMU

Araştırmayı destekleyen kurum: Boğaziçi Üniversitesi
Araştırmanın adı: Sınıf Öğretmenlerinin BİT Kullanımına Yönelik Aldıkları Seminer Sonrası Sunulan Çevirim İçi Forumdaki Etkileşimlerinin İncelenmesi
Proje Yürütücüsü/Araştırmacının adı: Serkan Özel, Canan Güneş
Adresi: Boğaziçi Üniversitesi, Kuzey Kampüs, ETA-B Binası, İlköğretim Bölümü Bebek/ İstanbul 34342
E-mail adresi:
Telefonu:

Sayın Öğretmen,

Boğaziçi Üniversitesi Sosyal Bilimler Enstitüsü İlköğretim Bölümü yüksek lisans öğrencisi Canan Güneş, "Sınıf Öğretmenlerinin BİT Kullanımına Yönelik Aldıkları Seminer Sonrası Sunulan Çevirim İçi Forumdaki Etkileşimlerinin İncelenmesi" adı altında bilimsel bir araştırma projesi yürütmektedir. Bu çalışmanın amacı sınıf öğretmenlerinin mesleki gelişim seminerleri sonrasında eğitimin devamı amacıyla sunulan bir çevirim içi forumdaki etkileşimlerini analiz etmek, bu etkileşimler ile ilişkili faktörleri tespit etmek ve bu etkileşimlerin öğretmenlerin eğitsel amaçlı BİT uygulama sıklığına etkisini incelemektir. Çalışma için okul yönetiminden gerekli izinler alınmıştır. Bu araştırmada bize yardımcı olmanız için siz sınıf öğretmenlerini de projemize davet ediyoruz. Kararınızdan önce araştırma hakkında sizi bilgilendirmek istiyoruz. Bu bilgileri okuduktan sonra araştırmaya katılmak isterseniz lütfen aşağıdaki katılmak istiyorum şıkkını işaretleyiniz.

Bu araştırmaya katılmayı kabul ettiğiniz takdirde oluşturulan çevirim içi foruma giriş için araştırmacı tarafından sizin adınıza bir hesap oluşturulacak ve bu hesap ve şifrenizi kullanarak sisteme gireceksiniz. Forumda paylaştığınız mesajlar analiz edilmek üzere araştırmacı tarafından incelenecek. Bu mesajlar siz öğretmenlerin çevirim içi forumda nasıl bir etkileşime girdiğini anlamamıza yardımcı olacaktır. Forumlara katılım miktarınızı ihtiyacınıza göre siz belirleyeceksiniz.

İkinci olarak, sizden kısa bir demografik bilgi formunu doldurmanızı rica edeceğiz. Demografik form yaşınız, cinsiyetiniz, medeni haliniz, toplam öğretmenlik deneyim süreniz,

eğitim durumunuz, geçmişteki çevirim içi forum deneyimleriniz, geçmişteki BİT araçları deneyimizin ve bilgisayar kullanma becerileriniz hakkında sorular içerecektir. Ayrıca sizlerden okul kültürü ve yönetimine yönelik düşünceleriniz ile öğretmen otonomisi ve sağduyunuza yönelik düşünceleriniz hakkında toplam 18 soruluk iki anket doldurmanızı rica edeceğiz. Bu form ve anketleri seminer günü sonunda doldurmanızı rica edeceğiz. Bu form ve anketleri doldurmak en fazla 30 dakikanızı alacaktır.

Son olarak, araştırmaya katılan öğretmenlerden rasgele seçilen katılımcıların sınıfları gözlemlenecektir. Sınıfları gözlemlenen öğretmenler ile çevirim içi forum hakkındaki düşünceleri hakkında yarı yapılandırılmış bir mülakat yapacağız. Mülakat sessiz bir ortamda bireysel olarak yapılıp, ses kayıt cihazı ile kaydedilecek.

Bu araştırma bilimsel bir amaçla yapılmaktadır ve katılımcı bilgilerinin gizliliği esas tutulmaktadır. Öğretmenlerin katılımcı isimleri ve şifreleri araştırmacının bilgisayarında saklanacak ve hiçbir şahıs ve kurumla paylaşılmayacak. Anket, form ve görüşme notları kilitli bir dolapta muhafaza edilip araştırma sona erdiğinde yok edilecektir.

Bu araştırmaya katılmak tamamen isteğe bağlıdır. Katıldığınız takdirde çalışmanın herhangi bir aşamasında herhangi bir sebep göstermeden onayınızı çekmek hakkına da sahipsiniz. Bu durumda size ait anket, form ve görüşme notları yok edilecek, çevrim içi forumda paylaştığınız mesajlar silinecektir. Araştırma projesi hakkında ek bilgi almak istediğiniz takdirde lütfen Boğaziçi Üniversitesi Sosyal Bilimler Enstitüsü İlköğretim Bölümü yüksek lisans öğrencisi Canan Güneş ile temasa geçiniz (Adres: Boğaziçi Üniversitesi, Kuzey Kampüs, ETA-B Binası, İlköğretim Bölümü Bebek/ İstanbul 34342).
Eğer bu araştırma projesine katılmayı kabul ediyorsanız, lütfen bu formu imzalayıp kapalı bir zarf içerisinde bize geri yollayın.

Ben, (katılımcının adı) ....., yukarıdaki metni okudum ve katılmam istenen çalışmanın kapsamını ve amacını, gönüllü olarak üzerime düşen sorumlulukları tamamen anladım. Çalışma hakkında soru sorma imkânı buldum. Bu çalışmayı istediğim zaman ve herhangi bir neden belirtmek zorunda kalmadan bırakabileceğimi ve bıraktığım takdirde herhangi bir ters tutum ile karşılaşmayacağımı anladım.

Bu koşullarda söz konusu araştırmaya kendi isteğimle, hiçbir baskı ve zorlama olmaksızın katılmayı kabul ediyorum.

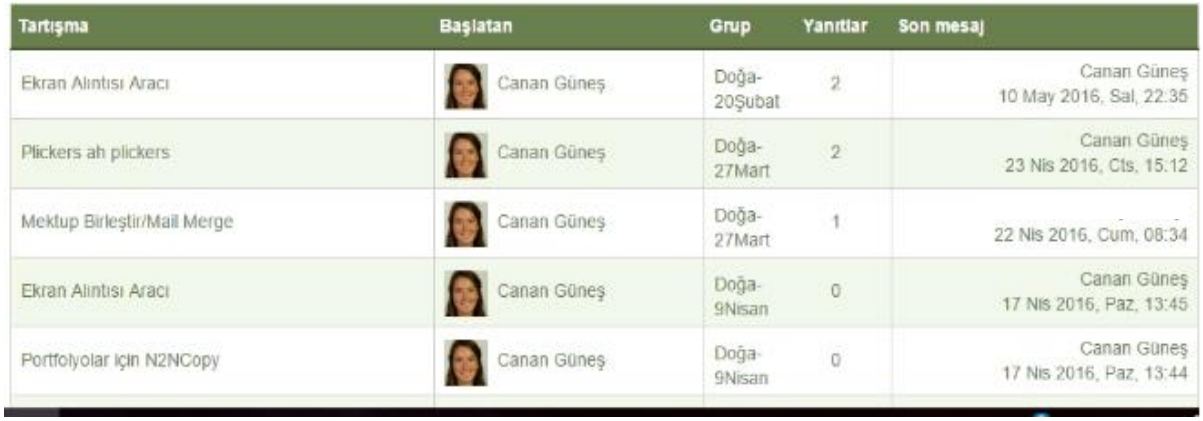
Formun bir örneğini aldım / almak istemiyorum

Katılımcının Adı-Soyadı:.....
İmzası:.....
Adresi (varsa Telefon No, Faks No):.....
.....
Tarih (gün/ay/yıl):...../...../.....

Araştırmacının Adı-Soyadı:.....
İmzası:.....
Tarih (gün/ay/yıl):...../...../.....

APPENDIX I

SCREENSHOTS FROM THE ONLINE FORUM



Tartışma	Başlatan	Grup	Yanıtlar	Son mesaj
Ekran Alıntısı Aracı	Canan Güneş	Doğa-20Şubat	2	Canan Güneş 10 May 2016, Sal, 22:35
Plickers ah plickers	Canan Güneş	Doğa-27Mart	2	Canan Güneş 23 Nis 2016, Cts, 15:12
Mektup Birleştir/Mail Merge	Canan Güneş	Doğa-27Mart	1	22 Nis 2016, Cum, 08:34
Ekran Alıntısı Aracı	Canan Güneş	Doğa-9Nisan	0	Canan Güneş 17 Nis 2016, Paz, 13:45
Portfolyolar için N2NCopy	Canan Güneş	Doğa-9Nisan	0	Canan Güneş 17 Nis 2016, Paz, 13:44

Figure I1 Organization of discussion postings on the online forum

Figure I2 An example from the online facilitator's thank-you messages

APPENDIX J

THE RESULT OF CFA

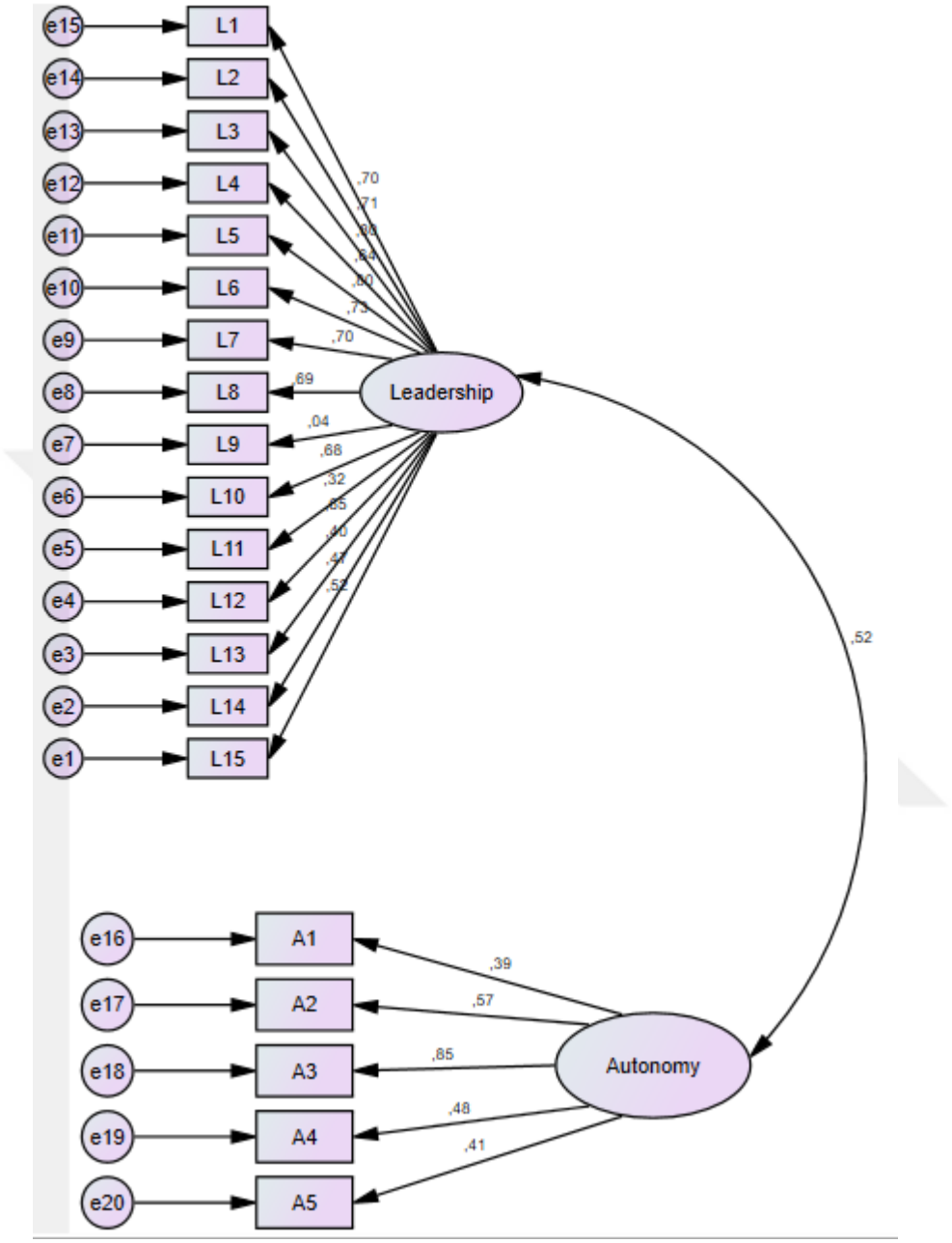


Figure J1 Two factors model with standardized estimates

APPENDIX K

CORRELATION MATRIX OF THE PREDICTOR VARIABLES

Table K1. Correlation Matrix of the Predictor Variables

Spearman Correlation Coefficients, N = 88												
	1	2	3	4	5	6	7	8	9	10	11	12
1 Gender	1											
	.											
2 Work Experience	-0,129	1										
	0,232	.										
3 Age	-0,15	,863**	1									
	0,163	0	.									
4 Education	-0,097	-,354**	-,378**	1								
	0,367	0,001	0	.								
5 Computer Competence	-0,105	-0,169	-0,195	0,172	1							
	0,33	0,116	0,069	0,108	.							
6 Reading	-0,113	-0,15	-0,144	,264*	0,165	1						
	0,297	0,163	0,182	0,013	0,125	.						
7 Sharing	-0,023	0,095	-0,053	0,039	0,132	,225*	1					
	0,831	0,38	0,624	0,721	0,22	0,035	.					
8 Asking	-,218*	0,016	0,026	-0,015	0,062	,291**	,446**	1				
	0,041	0,886	0,808	0,886	0,566	0,006	0	.				
9 Attitudes Towards ICT in Education	-,241*	0,079	0,063	0,029	0,04	0,055	,216*	0,204	1			
	0,024	0,464	0,557	0,788	0,71	0,609	0,043	0,057	.			
10 leadership	-0,128	,229*	,273**	-0,175	-0,132	-0,163	0,036	-0,048	0,185	1		
	0,236	0,032	0,01	0,104	0,219	0,129	0,741	0,66	0,085	.		
11 decisionmaking	-,304**	0,123	0,12	-0,079	-0,055	-0,096	0,114	0,099	,293**	,633**	1	
	0,004	0,254	0,267	0,464	0,609	0,372	0,29	0,358	0,006	0	.	
12 autonomy	-0,148	-0,014	-0,011	-0,101	-0,037	-0,182	0,089	0,002	0,096	,419**	,373**	1
	0,168	0,894	0,916	0,348	0,729	0,09	0,411	0,988	0,376	0	0	.
p < 0,05*; p < 0,01												

APPENDIX L

CONCEPT MAPS FOR QUALITATIVE ANALYSIS

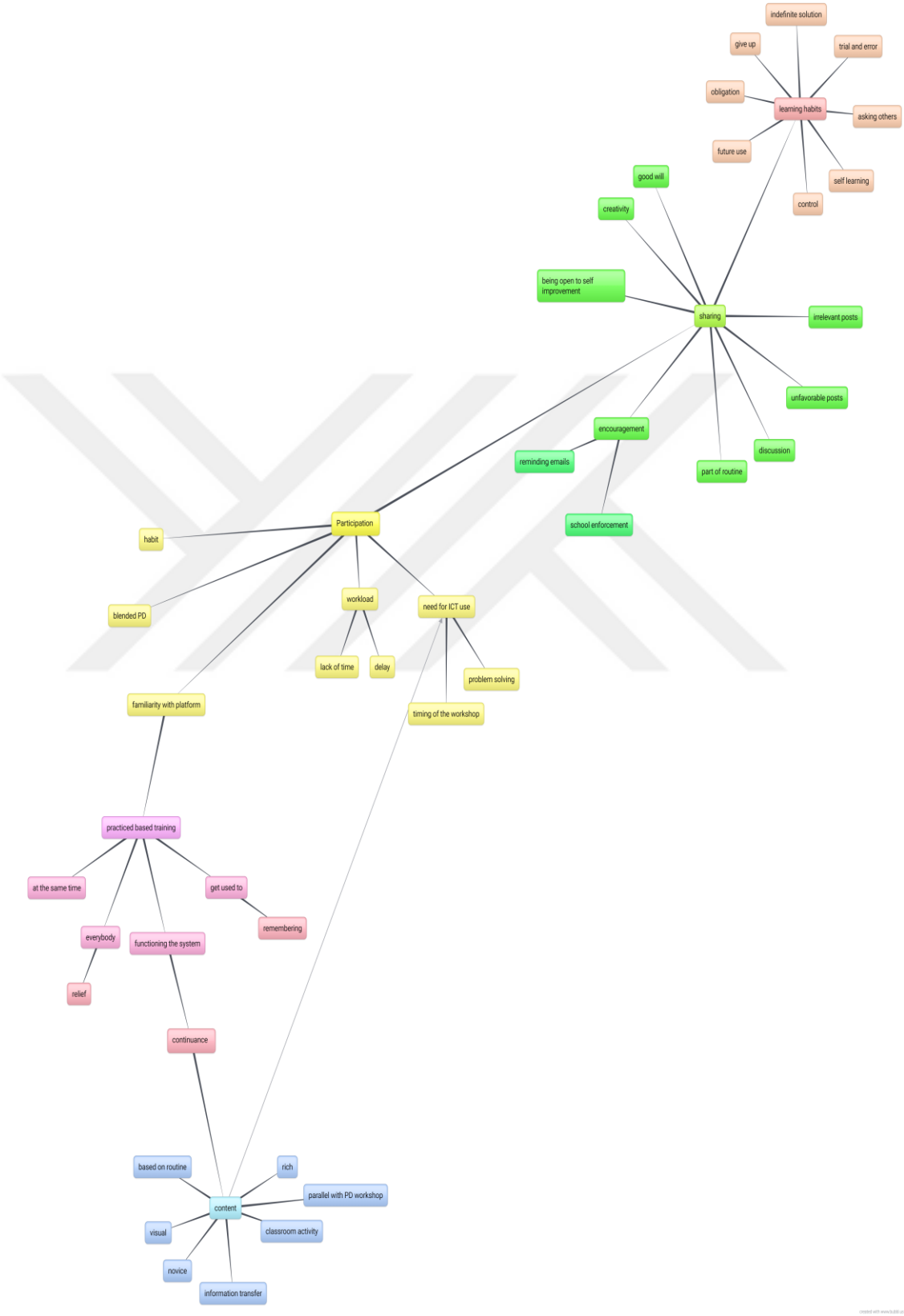


Figure L1 Concept map showing relationships between first cycle codes

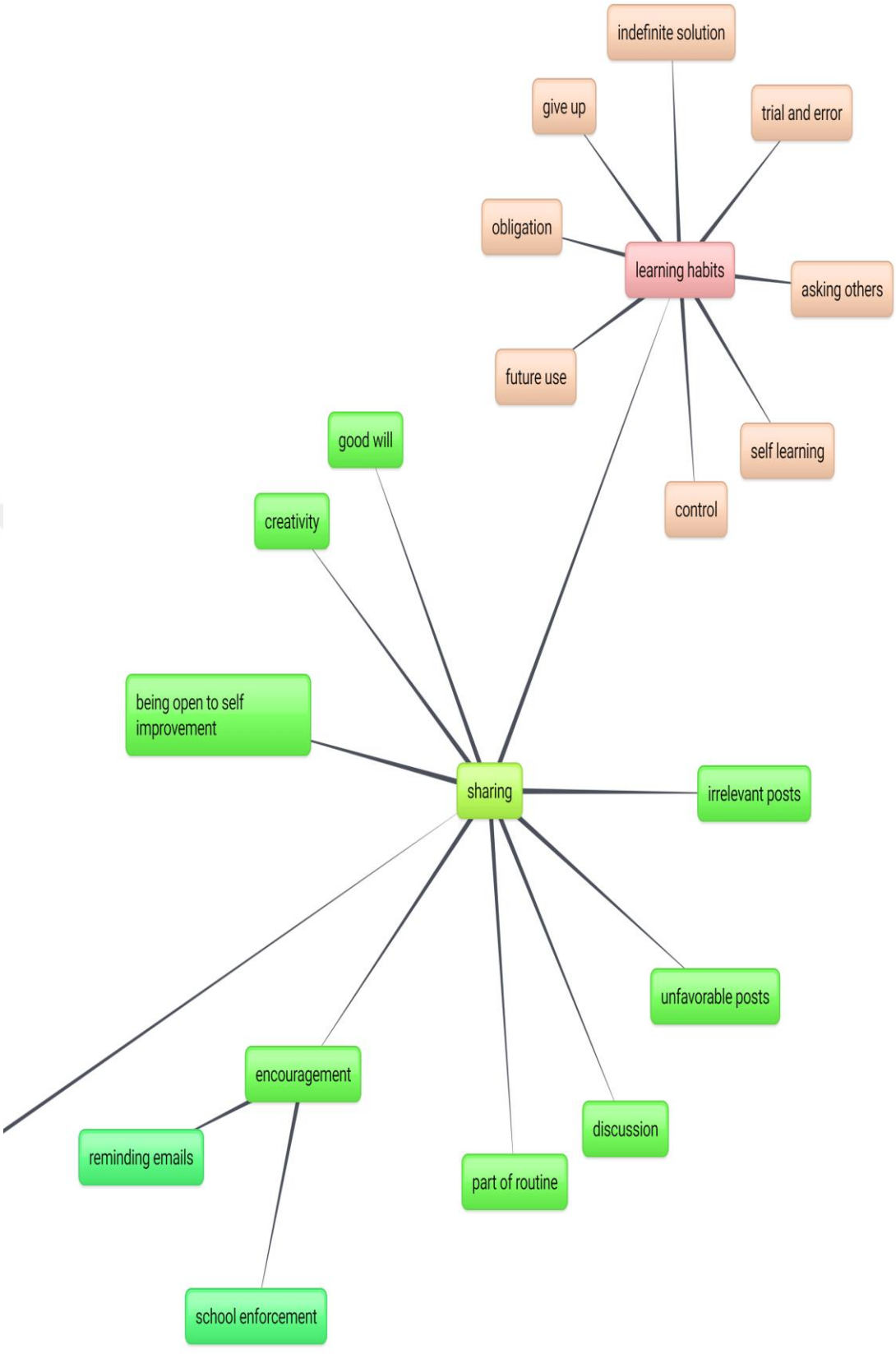


Figure L2 Detail 1 from Figure L1

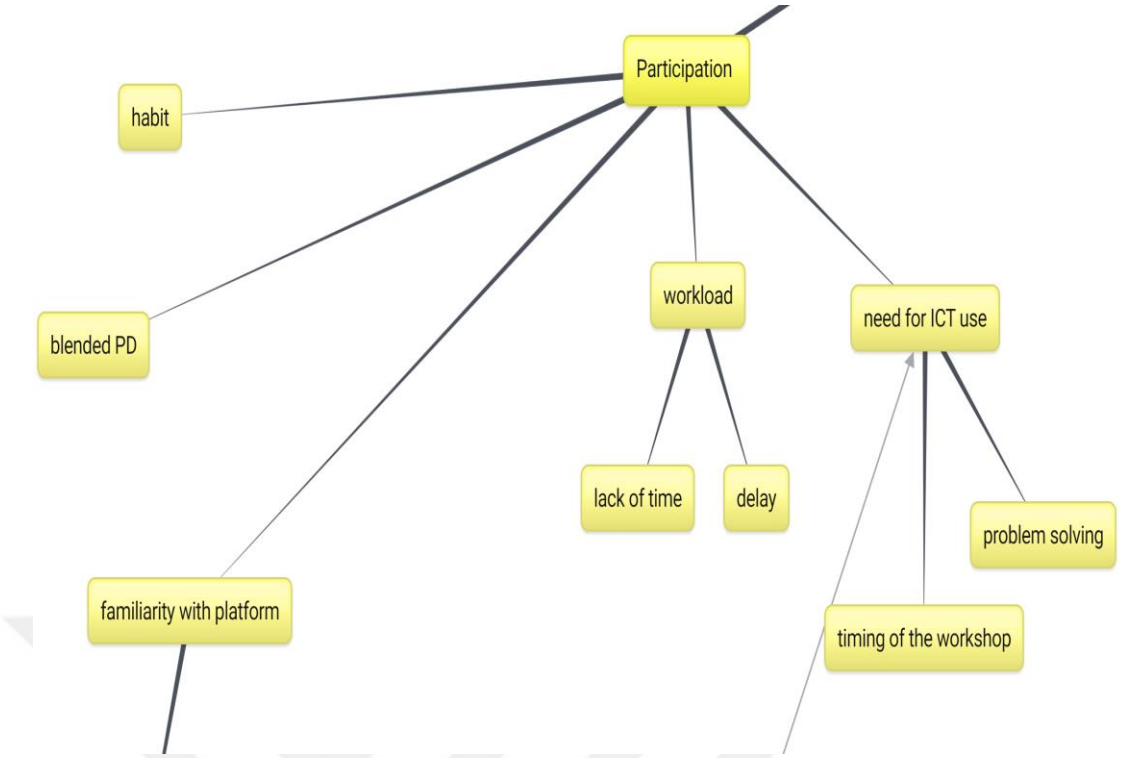


Figure L3 Detail 2 from Figure L1

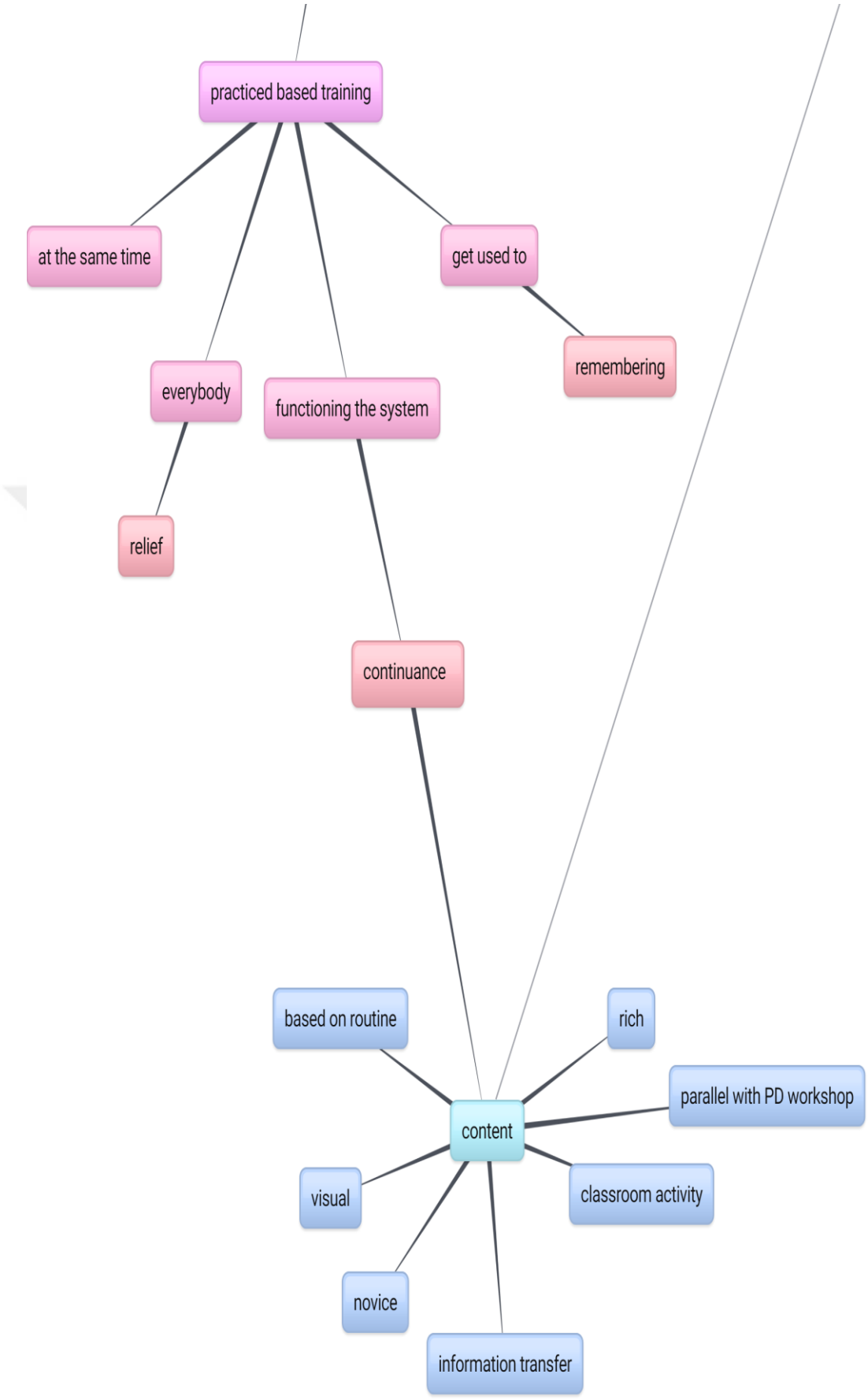


Figure L4 Detail 3 from Figure L1

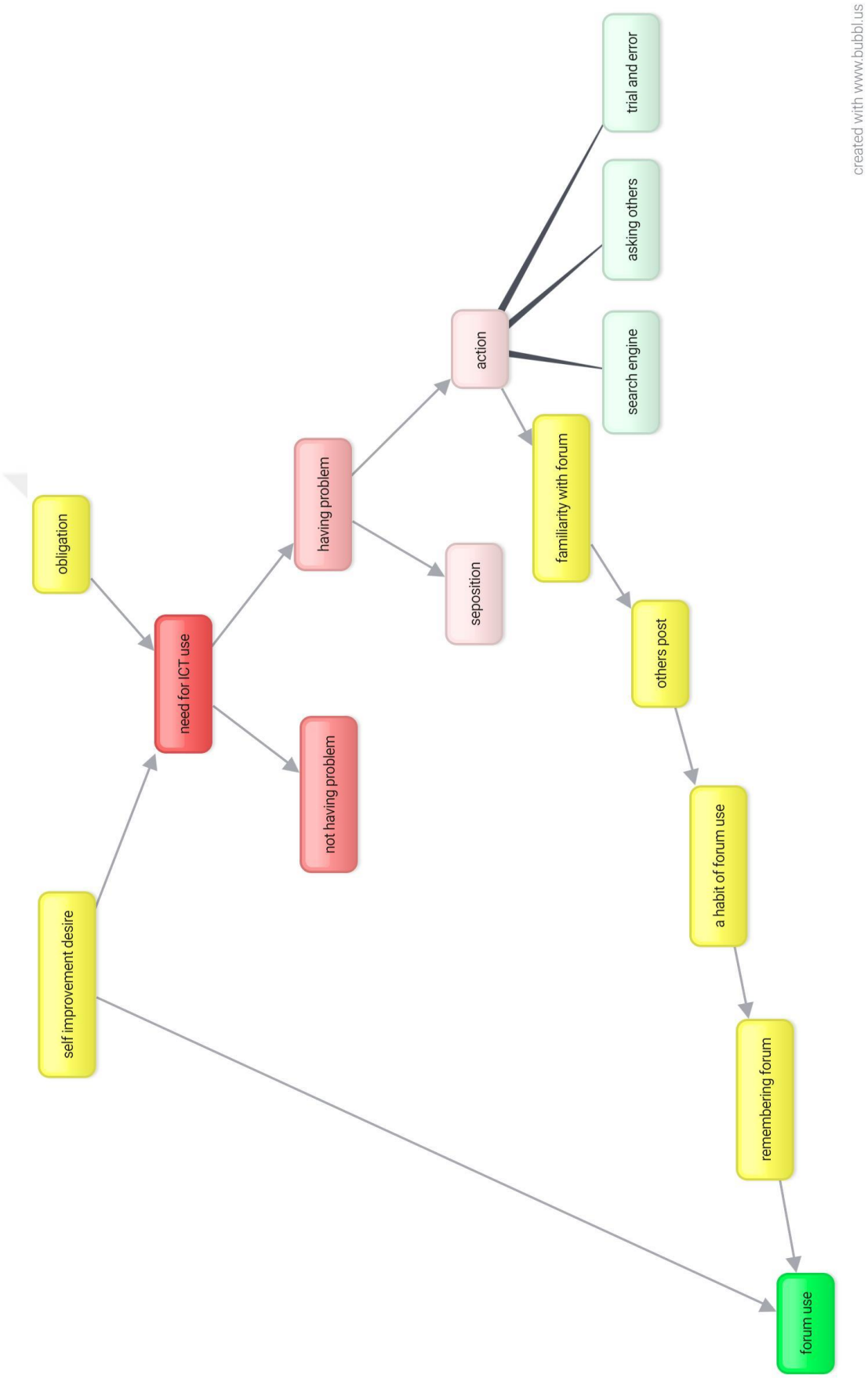


Figure L5 Concept map showing hierarchical relationships between categories

APPENDIX M

FREQUENCY TABLE FOR CATEGORICAL VARIABLES

Table M1. Frequency Table for Categorical Variables

		Total (N=89)		Participated (N=33)		Not participated (55)	s
Variable	Category	N	%	N	%	N	%
Age	Below 30	50	56	20	61	30	55
	31-40	20	22	8	24	12	21
	41 and above	17	18	5[a]	15	12	21
Gender	Female	70	79	26	79	44	80
Years in Teaching	1-5 years	49	55	17	52	32	58
	6-12 years	15	17	8	24	7	12
	13-20 years	7	8	3	9	4	7
	Above 20 years	17	19	5[b]	15	12	21
Education	Upper Secondary	8	9	1	3	7	12
	Undergraduate	70	79	31	94	39	70
	Graduate	10	11	1	3	9	16
Computer Competence	Medium	23	26	6	18	17	31
	Good	52	59	21	64	31	56
	Very Good	13	15	6	18	7	12
Forum Experience	Yes	43	48	22	66	21	38
Reading	Yes	37	42	18[c]	55	9	16
Sharing	Yes	17	20	10	30	7	12
Asking	Yes	8	9	5	15	3	5

[a]All teachers were above 50 years old.
[b] All teachers had above 30 years of teaching.
[c] Includes teachers with sharing or asking experience.

APPENDIX N

INTERVIEW QUOTES (TURKISH)

1) Mesela son olarak dünyanın oluşumu ya da işte dünyanın hareketleri konusunda bir etkinlik yaparken dünyanın iki tane hareketi var diyoruz ama bunun kendi ekseni etrafında 23 derece eğik olması niye vurgulanmıyor, kitaplarda yok dedik. Mesela mevsimler meydana gelme olayının eksen etrafında yapılan dünyanın döngü açısı, bu yoktu. Bunu mesela direk paylaştım. Onlar da dediler ki evet hocam kitaplarımızda yok ama biz bunu paylaşabiliriz. Sonra da dünya maketleri küçük hani dünyanın etrafına, güneşin etrafına dört tane şeyi koyup işte yakın yakın, uzak uzak şeklinde...Yakınlardaki dönen bahar şey yaz, uzaklaştığı dönemlerdeyse sonbahar ya da kış olgusu vurgulandı. Gece ve gündüzle beraber
2) İşte mesela drama eğitmi almıştık drama eğitiminde mesela bir şiiri bizden sesli olarak okunmasını istemişlerdi. Sonra onu bizden alıp dinleyeceklermiş falan değerlendirmek için gibi, diksiyon anlamında, mesela şiiri nasıl okuyup okuyamadığımız
3) Mesela yan sınıftaki arkadaşımın o saatte hangi dersi işlediğini, bir saat sonra ben alıp kendi sınıfımda onun, o uygulamayı belki bir gün sonra ben de uygulayabiliyorum. Bu da her iki meslektaş arasındaki bilgi alışverişine neden oluyor.
4) Bize gösterdiniz biz biliyoruz nasıl yapılacağını ama onun dışında başka birilerinin de öğrenebilmesi açısından foruma katılmak istedi mesela böyle dışarıya açık olacak mı?
5) Tabi tanımadığımız insanlar olunca risk biraz daha yükselebilir. Tanıdığınız insanlarla en azından bir arada olma zorunluluğunuz olduğu için onlarla pek fazla

problem çıkmayabilir. Ki bu bir platform olduğu için herkes birbirini tanımadan gelecektir.

6) hani şimdi bununla (online forum) ilgili ne zaman ihtiyaç duyar, bunu (ICT uygulamalarını) uyguladığında uyguluyorsa, uyguladığı zaman bir sıkıntı duyuyorsa o zaman ihtiyaç duyar.
7) Bu (online forum) hani öğretmen sınıfında neyi daha iyi nasıl yapcağını düşünmüyorsa onun için bir ihtiyaç olmaz.
8) BU biraz da öğretmenin kendisini yetiştirmeye açık olması açısından, demekki gelişime çok fazla açık değil.
9) İlgin varsa daha çok kullanırsın, ilgin yoksa kullanmak istemezsin.…Kendini geliştirme ilgisi diyebiliriz.
10) nasıl olsa excellle bir işim yok diye attın çöp kutusuna, oradan da çöpe gitti.
11) yani boş kaldıkça da yapmaya çalışıyorum çünkü, yani evet bundan sonra muhtemelen bunu(excell) kullanacağız ve öğrenmek zorundayım
12) doğa okullarında zorunlu olsaydı kesin kullanılırdı diye düşünüyorum.
13) sizinle biraraya geldiğimde ben yine bunu kullanacağım için öğrenme ihtiyacı duyar ya da birşeylerde kullanma ihtiyacı duyar orada tekrar bunu uygulayabilirim.
14) bir sınıf listesi oluşturuyorum arama raporu oluşturuyorum genelde ama çok fazla excelli kullanma ihtiyacı duymuyorum çünkü işim excell ile değil. lazım olduğunda kullanmam gerekiyorsa da bilmediğim için hop word de bir tablo oluşturuyorum onun üzerinden gidiyorum.
15) Hani bizim bünyemizde bilgi işlemler var biliyorsunuz onlara belki bu şekilde öğretilebilir o hani biz onlardan öğrenebiliriz ama onlar da şu an hiç birşey bilmedikleri için?

16) Mesela bir şey bulduğum zaman çözüme ihtiyacım olduğu zaman google a aratma yaptığım zaman forum sitelerinde genelleri çözümleri bulabiliyorum.
17) Ben genelde arama motoruna sorarım. Başkasına bile sormam, arama motorunda hallederim işimi.
18) Mesela geçen gün evde tektim. önce şeye girdim google da satır genişletme, çözecem bunu bu sefer dedim. orada bir takım yönergeler, a-a olmadı. sonra bir başka siteden bir başka birşey olmadı sonra bilen bir arkadaşıma mesaj attım o birşeyler söyledi valla en sonunda çünkü ben onu en sonunda kopyaladım silinirse de elimde hazır bir tane var. orasını burasına basarken dediğim gibi baya bir kör dövüşü yaparak sonuçta budum.
19) Ama diğerleri gibi düşündüğüm zaman da genelde insanlar o forum arama siteleri, ki en kolay bulma şekli arama motorunda tarama, ki bunu bile yapmayıp etrafa soruyorlar.
20) Yani yanıt verecek olan varsa teknik servis vardır. Teknik servisteki arkadaşım söylerse o belki benden çok daha iyi bilgisayar bilgisi var çünkü. Veya bilişimle ilgili olan kişiler olduğunda onlarla bir sıkıntı olmuyor. Zaten ben de kendim de sürekli bilişimle ilişkisi olan insanlardan sürekli bu konuda bilgi almaya çalışırım. Daha önceki çalıştığım okullardaki bilgisayar öğretmeni arkadaşlarla sürekli iletişim içinde olurum.
21) insanlarda orada bir kere alışkanlık haline gelirse zaten, sürekli süsrekli dönüp dönüp, oraya bakacaktır
22) Yine gerçekten bir insanın foruma giresi varsa. Çünkü hani herkesin Internet kullanma amacı farklı hani form kullanıcısı olabilmek de herkesin yaptığı bir lşey değil işin açıkçası.

23) etkinlik odaklı, bunların haber süreci de olabilir ya da yapılan işle alakalı paylaşımlar olabilir. benim ilgimi çeken genelde gezindiğim noktalar bunlar yani Interneti kullandığımda. onun dıında çok bişey için kullanmıyorum.

24) Ama dediğim gibi bizim ona adapte olabilmemiz için bir ders saati, iki üç ders saati uygulama yapmamız lazım.

25) devamlılık arzetmeyen şeyler alışkanlık haline dönüşmüyor

26) o gün mesela yaptığımız uygulamalara ekstra bunu da kullanıp girseydik, kullansaydık, şey olurdu biraz daha aktif olurdu.

27) forumun ne olduğunu biliyorum ama nasıl kullanacağımı bilmediğim için girmedim

28) Örneğin herhangi bir linkte bir türkçe okuma yazma öğretimi, bunun içeriğinin olması lazım bununla ilgili video olduğunu aynı zamanda bunu açtığın zaman nasıl kullanılacağını

29) Tam olarak onu bilebilmem için bana onu on kere de anlatsan buradan dışarıya çıktım mı direk unuturum.

30) Seminerlerde yaptığınız açıklama aklımda değil açıkçası.

31) o gün mesela girdik mi biz bu platforma, sözel olarak kaldı sadece değil mi. sözel olarak kaldığı içinde belki de pek bir işlerliği olmadı bizim açımızdan.

32) mesela bilgisayarı ile gelecek, sistemi oluşturduk zaten açacaz sistemi karşılıklı yazışacağız orada bulunduğumuz ortamda. Sen bana yazacaksın, ben sana yazacağım. Bu şekilde, yanımdaki arkadaş yazacak buraya bir şey yükleyeceksem yükleyeceğim. Yüklediğim hakkında yazışarak tartışacağız.

33) İşime yarayacak bilgiler olabilirdi mesela birinci sınıfla ilgili dökümanlar, ikinci sınıfla ilgili dökümanlar her sınıfla ilgili dökümanlar olsaydı kesin girerdim heralde. …Mesela 3. sınıf öğretmenlerine bir konuyu nasıl anlatabilirim ile ilgili bir şey olabilir. O tarz. (Cemile)

34) eğer öğretmenler bu platformun içine çekilmek isteniyorsa o zaman öğretmenlerin ders işlemelerine [ilişkin olarak]…. Ders işleyişine yönelik olabilir. Birinci etapta bu olabilir…öğretmenlerin kendi sınıflarında uygulamış oldukları etkinliklerin olumlu olanlarını, başarılı olanlarını oraya konulabilir (Mahmut)
35) Ama mesela devamlı her girdiğimde ben dersimi kolaylaştıracak bir şey bulduğum zaman, her girdiğimde beni, çünkü gerçekten ben şeye baktığımda gerçekten böyle şeyleri ben çok arıyorum özellikle. (Ersoy)
36) Yoo hani öğretmenler de koysun ama ilk başta baktığımda çok bir şey göremediğim için belki de daha sıfır kullanılmamış bir site olduğu için direk göremeyince vazgeçmiş olabilirim. ilk yüklüolsa birazcık birşeyler o zaman belki daha çok ilgimi çekebilirdi
37) O anda oradaki kişilere bağlı olduğum kişilerle en az bir kere yazışmam gerekir. Ki sistem şeyine otursun, rayına otursun.
38) Ucunu bir işte kurucular bir ucundan başlattığı zaman o bir şekilde zaten siz çok daha iyi biliyorsunuz.
39) Ama şey olduğu zaman, mesela herkes bir şey paylaştığı, herkesin paylaşacağı bir yer olmaya başladığı zaman, bu algı yaratıldığı zaman o zaman öyle olmaz (yönetici mesaj paylaşmak zorunda kalmaz)
40) ya zaten orada cevap bulabilirsem ben, benim o içinde kalmaya devam edebileceğim bir ortam olur. değilse zaten, hani bir soruma sonraki bir başka sorunuma orada bir geri donüş yapılmıyorsa zaten 3. sünde ben oraya soru bile sormam.
41) gerçekten o platformu yararlı görüyorsa ve kendinin de deneyim olarak bazı tecrübelere sahipse paylaşımcı biriyle evet bulabilirim.
42) Genellikle zaten bizim niteliğimizdeki insanların bunu farklı bir amaçla kullanması zaten düşünülemez.

43) Yoksa ben burada kalkıp da özel bir şeyi deklare edecek şeyim yok. Yani ben Ahmet'le Ersoy'le beraber şuraya gittim.

44) güvenilir olduğunu bilsem kalırım yazarım, hani çok fazla günümüz çağında da nasıl deyim farklı sosyal ilişkiler de olduğu için insanlar biraz daha psikolojik olarak eksik olduğu için orada kim ne isimle ne yapıyor bilmiyorum.

45) Diyebiliriz, zaman ayırma. çünkü eve gidiyorum tekim. atıyorum başkalarının hayatında daha farklı olabilir. ama yemek süreci de geliyorum yarının planlanmasıdır. ekstra yapılacak şeyler varsa onların yapılmasıdır. ödev, hergün ödev veriyorum ödevlerin okunması bunlarla ilgili geri dönüşlerin yazılması zaten akşam bitiyor. yine zaman yetmiyor bir noktada.

46) Kullanmamanızın bazı sebepleri olmalı

47) çünkü çocuklar somut işlemler döneminde ve oyun çocukları o yüzden sevdiği şeyle mesela sevmediği şeyi bağdaştırırsanız daha kalıcı süreçte ilerleme kaydedersiniz. ya da mesela o oyun hamurları hem mesela, el göz koordinasyonu için şekil vermesi açısından yararlı aynı zamanda aktif olarak derse katılıyor. dediğim gibi bu da kalıcı öğrenmeye hizmet ediyor ve çocuklar teknoloji çağında oldukları için sürekli tablet bilgisayar telefon ellerinde. bunlar da aynı zamanda onlar için cazip şeyler, cazip olan şeyler le öğrenmesi gereken şeyleri ilintili hale getiriyorum sadece süreçte.

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