Investigation of the Turkish primary school teachers' perceptions of the factors which help or hinder the integration of information and communication technology (ICT) into teaching and learning

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Abstract

In recent years, information and communication technology (ICT) has been increasinlgy recognized as an important tool for the purpose of providing students with the knowledge and skills needed for the challenges of information society and knowledge-based economy. Thus, many initiatives have been launched by the Turkish government concerning curricular and structural reforms in order to achieve a successful integration of ICT into primary school system. The main theme of this study is to investigate the Turkish primary school teachers' perceptions of the factors which help or hinder the integration of ICT into teaching and learning by them. In this study, data was collected from 42 teachers from four primary schools located in the Anatolian side of Istanbul in Turkey by means of administering questionnaires and conducting semi-structured interviews. This study indicates that there are many factors operating at different levels and helping or hindering the integration of ICT into primary schools in Turkey. According to results of this study, teachers' beliefs and attitudes, school leadership, and the school culture and ethos have been found as helping factors for the ICT integration. On the other hand, this study has revealed many factors hindering the ICT integration, such as lack of ICT skills and knowledge, lack of confidence in the use of ICT, lack of technical and pedagogical support, inadequate ICT resources, inappropriate ICT training programmes and ineffective national ICT policies. Considering these results, this study suggests that factors which are effective in the ICT integration need to act in harmony in order to have a successful integration of ICT into teaching and learning. This study also makes some recommendations about how the new ICT training programmes or new implementation strategies should look like in the current context in Turkey.

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CHAPTER ONE

1. INTRODUCTION

The aim of this research is to investigate the Turkish primary school teachers' perceptions of the factors which help or hinder the integration of ICT into teaching and learning by them. It is evident from many studies that ICT has had a remarkable impact on all aspects of society over recent years (Tearle, 2003; Twining, 2001). Since schools must respond to demands of new technologies, it is not surprising that in the last two decades integration of ICT into education has been well supported by almost all governments (Levin & Wadmany, 2005). In Turkey, for example, the use of computers in education began more than twenty years ago. Computers were first introduced to secondary schools by the Ministry of National Education (MoNE) in 1984 (Akbaba -Altun, 2006). More recently, the Basic Education Programme (BEP) Loan Agreement was signed between MoNE and World Bank in 1998 in order to improve the national primary school system (MoNE, 2008). One of the most important components of BEP, which consists of two phases, was to integrate ICT into primary schools. The first phase of BEP involved large investments in ICT infrastructure and was completed in 2003. MoNE established 6837 ICT classrooms in 5451 primary schools and provided them with computers, printers, scanners, and educational software in order to foster greater ICT integration (MoNE, 2008). More than 40.000 primary schools teachers were trained in the use of ICT in different in-service training programmes provided by MoNE in this programme. In addition to these, almost 82% of primary schools and 95% of secondary schools have been supplied with ADSL internet connection by MoNE through 'Internet Access Project'. The second phase of BEP is still being implemented with the aim of supporting the integration of ICT into Turkish primary schools.

Furthermore, other ICT projects are still ongoing that are being executed by the General Directorate of Educational Technologies (GDET). The aim of these projects is not only to provide ICT infrastructure and resources, but also to support teachers starting to use ICT in their teaching and learning in a number of ways. For instance, one of the important projects is 'Education for Future Project' that aims to provide teachers with an in-service training in the use of ICT in their teaching and learning. Another project is 'Educational Portal' which is seen as a gateway to national curriculum, a range of online services and

digital learning resources for teachers and students (MoNE, 2008). It also provides a learning environment and online training opportunities for teachers to develop their ICT skills and share their experiences with their colleagues through this portal.

In addition to these projects, new primary curriculum (grade 1 to 8) has been developed and is being implemented in primary schools since 2004 in Turkey. One of the basic objectives of the new primary curriculum is the incorporation of ICT into teaching and learning practices (Bulut, 2007). Hence, the goal of this curriculum is to shift from teacher centred learning to student centred learning (Babadogan & Olkun, 2006) and change the pedagogy from a behaviourist approach to a more constructivist one (Bulut, 2007). According to Turkmen (2006), the basic idea behind the new curriculum is to provide students with necessary skills that they will need in the future knowledge society, such as critical thinking, problem solving, scientific research, creative thinking, and using ICT.

Consequently, to achieve a successful implementation of ICT in education, many reform initiatives have been launched by the Turkish government concerning curricular and structural reforms in order to "upgrade educational provision" and meet "the strategic educational objectives of European Union" as a candidate country (Aksit, 2007, p.132). However, Turkey has many educational challenges ahead, including a very large and centrally administered education system, large number of students and teachers, insufficient technological infrastructure and the shortage in funding of educational institutions (Goktas and Yildirim, 2003). Thus, the integration of ICT especially into a centralized education system such as Turkey is a complex and expensive process (Akbaba-Altun, 2006), which must be seen as a large scale educational change.

Given the impact of ICT on the workplace and everyday life, today's schools, such as in Turkey, are trying to integrate ICT into their context in order to provide students with the skills and knowledge necessary for the future knowledge society. However, integration of ICT in education is not simple issue and depends on various factors affecting the implementation process. In other words, it is a complicated process which is "shaped by pedagogical philosophies, curricular requirements, and the proliferation of ICT in society at large" (Granger *et al.*, 2002, p.480). Many research studies on this subject show that many schools are failing to integrate ICT into their existing context, despite the presence of several ICT projects, teacher professional development programmes and huge investment in ICT resources by governments. Although the importance of ICT in

education is widely accepted by teachers, attempts to integrate technology into teaching and learning are often restricted due to either external or internal barriers (Ertmer, 1999). Thus, in recent years, a number of research studies have focused on investigating the factors helping or hindering the implementation of ICT in schools. While some of the studies have investigated the barriers to the uptake of ICT by teachers (Jones, 2004; Pelgrum, 2001; Cox *et al*.1999a), others have highlighted the factors enabling teachers to make successful use of ICT (Scrimshaw, 2004; Cox *et al*. 1999a), and a few of them have emphasized the organisational and external factors affecting teachers' use and perception of ICT in their teaching and learning (Younie, 2006; Grainger & Tolhurst, 2005; Cohen et al. 2004; Tearle, 2004; Mumtaz, 2000).

Many of them identified a number of factors affecting the integration of ICT into schools and categorized them under different kinds of dimensions. According to findings of her case study, Tearle (2004), for example, identified three key areas that are influential for the ICT implementation: *the whole school, the ICT implementation process* and *the individuals*. In their study, Ertmer and her colleagues (1999) categorised these factors under two different headings: *external (first-order)* and *internal (second-order) barriers*. Moreover, in a report published by Becta, Scrimshaw (2004) organized the factors enabling teachers to make successful use of ICT as *teacher level enabling factors* and *whole school level enabling factors*. Similarly, in his literature review on barriers to the uptake of ICT by teachers, Jones (2004) classified these factors impeding the integration of ICT into classrooms into two categories: *teacher level barriers* and *school level barriers*.

Mumtaz (2000) suggests that successful implementation of ICT needs to focus on three interlocking frameworks for change: the teacher, the school and policy makers. However, she highlights the importance of teachers' role in the integration of ICT among these three dimensions. Moreover, Fullan (2001, p.115) takes this further by stating that "educational change depends on what teachers do and think". He argues that the role of teachers is crucial in the implementation process and suggests three aspects that teachers would experience if they were to implement a new learning approach: new materials, new behaviours/practices, and new beliefs/understandings (*ibid*).Thus, it is important to take into consideration teachers' needs and wants in the implementation of any educational reform such as ICT, since every educational reform brings considerable amount of change to the education system and teachers are at the heart of this change process. Nevertheless,

considering Turkey, although there are several research related to implementation of ICT in schools in general (Ozdemir & Kilic, 2007; Memisoglu, 2007; Akbaba-Altun, 2006), there is a limited number of reported empirical study on teachers' use of ICT in teaching and learning. This study, therefore, attempts to investigate the factors that help or hinder the Turkish primary school teachers to integrate ICT into their teaching and learning through seeking teachers' views. In order to shed light on the complexity of ICT integration into Turkish primary schools, this research mainly focuses on the following two questions:

- What are the teachers' perceptions of enabling factors that help them integrate ICT into teaching and learning?
- What are the teachers' perceptions of the barriers which hinder the integration of ICT by teachers in their teaching and learning?

CHAPTER TWO

2. LITERATURE REVIEW

This chapter includes a literature review that sets the research questions in the context of up-to-date literature. It is crucial to provide a framework for the evaluation and interpretation of the data. So, this chapter will review some of the recent research studies about the factors affecting the implementation of ICT in education. As it is evident in the literature, many studies tend to classify these factors mainly into two different categories: individual and organizational level factors. However, while factors at the national level have been generally examined together with the organizational level factors, this study investigates national level factors as a different topic, in order to emphasize the effects of centralized education system on the implementation of ICT in Turkish primary schools.

Having said that Mumtaz (2000) emphasizes concentrating on three interlocking frameworks for the successful implementation of ICT: the teacher, the school and policy makers, therefore, this study focuses on three different levels of factors: teacher level, school level and national level factors. In the literature, teacher level factors mainly refer to teachers' beliefs and attitudes, teacher confidence and teachers' knowledge and skills about the use of ICT. At the school level, factors affecting the use of ICT are school leadership, access and quality of resources, technical and pedagogical support, school ethos and collaborative culture. Factors at the national level indicate government's commitment to the ICT policies, financial support and encouragement for the effective implementation of ICT, and professional development and training.

2.1. Teacher level factors

2.1.1. Teachers' beliefs and attitudes

Many studies have showed that teachers' beliefs and attitudes towards ICT in education have a significant influence on how they integrate ICT into teaching and learning and how they motivate themselves to use ICT resources in the classroom (Cox *et al.*, 1999a; Ertmer *et al.,* 1999; Jimoyiannis & Komis, 2007). It is less likely for teachers to make successful use of ICT in teaching and learning unless they are aware of the benefits of using ICT in education. Cox *et al.*, (1999b), for instance, argue that if teachers see ICT as a useful tool

for themselves, their teaching and their students' learning, they will probably have a positive attitude towards the use of ICT in their teaching and learning. Research also suggests that there is a reciprocal relationship between teachers' beliefs and classroom practices. While classroom experience affects how teachers' knowledge and beliefs about teaching and learning are being formed, at the same time, teachers' knowledge and beliefs also play a significant role in influencing and underpinning their classroom practices (Levin & Wadmany, 2005). For example, in their research on ubiquitous computing in schools, Windschitl & Sahl (2002) found that the ways in which teachers learned to integrate ICT "were powerfully mediated by their interrelated belief systems about learners in their school, about what constituted 'good teaching' in the context of the institutional culture, and about the role of technology in students' lives" (p.165).

Furthermore, some of the studies have pointed out the "personal philosophical beliefs of teachers" that have been found very influential in determining whether teachers will use ICT in their teaching and how it will be used by teachers (Ertmer & Albion, 2002; Becker, 2001). As it is well known that teachers' beliefs are determinative factors in their planning, pedagogical decisions and teaching practices (Bandura, 1986; Pajares, 1992; Jimoyiannis & Komis, 2007), there is also convincing evidence which suggests that the use of ICT associates with the constructivist beliefs of teachers. According to findings of large-scale survey of teachers in the USA, Becker (2001, p.11), for example, found that "teachers with the most constructivist teaching philosophies are stronger users of computers: they use computers more frequently, they use them in more challenging ways, they use them more themselves, and they have greater technical expertise". Similarly, in their case study, Levin and Wadmany (2005) found that teachers who experienced the most significant changes in their pedagogy moving from positivism to constructivism are the ones who considered ICT as a companion in their teaching and learning, and used ICT in their teaching with constructivist learning approaches.

In addition, students have been also found another factor affecting the teachers' beliefs and attitudes towards to the use of ICT in the classroom. According to findings of their study, Higgins and Moseley (2001) revealed that teachers' beliefs and attitudes about ICT and how it should be used in the classroom are considerably associated with the student outcomes in literacy and numeracy. Furthermore, Levin and Wadmany (2005) suggest that "the power to change does not lie in with the technology itself, but with the restructured

collective vision of teacher and students in the classroom as they experience new modes of learning in a rich, technology-based environment" (p.283).

Another reason that has been found for the failure of ICT integration in schools is the lack of shared visions about the role of ICT in education. This point is particularly important if we consider that teachers are always resistant to educational change, and need a clear meaning of the educational innovation for the successful implementation (Fullan, 2001). Van Driel *et al.* (2001, p.137) contend that "reform efforts in the past have often been unsuccessful because they failed to take teachers' existing knowledge, beliefs, and attitudes into account". Moreover, Levin and Wadmany (2005) suggest that if there is a convenient match between teachers' beliefs and educational innovation, it is highly possible that new thoughts and practices will be embraced by teachers in the classroom. Therefore, to achieve a successful implementation of any educational innovation, such as ICT, teachers' beliefs must be taken into consideration. However, it must be noted that various kinds of beliefs held by teachers will show different degree of resistance to the educational innovation (Ertmer & Albion, 2002).

2.1.2. ICT knowledge and skills

It is evident from previous research that it is very unlikely to have a successful educational innovation without providing teachers with the necessary knowledge and skills (Pelgrum, 2001). Likewise, many studies have demonstrated that teachers' level of knowledge and skills in the use of ICT has been an influential factor in determining to what extent teachers integrate ICT in their teaching and learning. According to Jones (2001, p.35, cited in Grainger & Tolhurst, 2005, p.2), "educators are urged to incorporate technology into instruction, but the effectiveness of educational technology is determined by teachers' readiness to use it, not by its mere presence in the classroom". Thus, students can only benefit from the opportunities provided by ICT resources, if the teachers have enough ICT skills and knowledge "to design the curriculum activities to implement the ICT activity effectively into the learning programme" (Cox & Marshall, 2007, p.64).

Higgins and Moseley (2001) emphasize the importance of having good ICT knowledge and skills by teachers. In their research study, they suggested that "the most effective teachers not only had a positive attitude towards ICT, but also had good ICT skills" (*ibid*, p.202). In her case study which focused on the interaction between teachers' perception of

ICT and their pedagogy, Loveless (2004) found that teachers' perception of ICT capability interacts with "their repertoire of representations of the concepts, knowledge and skills for young children" (p.323). Furthermore, in a recent survey which was conducted with 1165 primary and secondary school teachers, Jimoyiannis and Komis (2007) argued that it was critical to provide teachers with opportunities to gain necessary ICT skills and knowledge, in order to reinforce their beliefs about the benefits of using ICT in teaching and learning.

On the other hand, many research studies have pointed out the lack of teachers' ICT knowledge and skills which has been found as a barrier for the integration of ICT. For example, in their multiple case study research which was carried out in five different European countries, Peralta and Costa (2007) found that there were not many teachers whose knowledge and skills were enough to use ICT for instruction. According to their findings, although teachers knew how to use computers, they were not capable to use them with their pupils in the classroom. Moreover, they found that teachers used ICT without full understanding of the learning principles. So, they concluded that ICT did not make any important changes in the role of teachers, their attitudes and classroom practices. In addition, in a study conducted in elementary and lower secondary schools from 26 countries, Pelgrum (2001) found that the major obstacles perceived by educational practitioners were firstly the lack of ICT equipments in their schools and secondly the insufficient knowledge and skills in the use of ICT.

Moreover, in his literature review on barriers to the uptake of ICT by teachers, Jones (2004) revealed that the lack of teacher competence in the use of ICT was directly associated with the lack of pedagogical training, the lack of 'self-training' and the lack of skills training. He argued that the lack of competence and quality ICT training for teachers might be seen as a barrier to the use of ICT by teachers. Furthermore, he suggested that the level of teacher confidence was also directly associated with the level of ICT knowledge and skills acquired by teachers.

2.1.3. Teacher confidence and computer anxiety

In terms of individual level factors, many studies have found teacher confidence and computer anxiety as a crucial factor affecting the integration of ICT into education. According to Russell and Bradley (1997a), teachers' knowledge and confidence have become an important decisive factor in the implementation of ICT with the expectation

that teacher will not only be a computer literate, but also they will use computers effectively in their classroom. Similarly, Krumsvik (2006) suggests that "teachers need to become digitally confident in order to understand how they can utilise their students' digital self-confidence in the processes of knowledge construction and learning" (ibid, p.246).

Russell and Bradley (1997a) describe teachers' lack of confidence in using computers in the classroom as 'a form of computer anxiety' or 'cyberphobia' which might influence the performance of teachers when they use computers in their classroom. In their research study with 350 Australian primary and secondary school teachers, they identified three different types of sources that caused teachers to become anxious about using computers: "(a) damaging the computer's hardware or information base, (b) being unable to perform computer-related tasks efficiently, and (c) exposing themselves to social embarrassment when working with computers" (Russell & Bradley,1997b, p.279). Furthermore, Jones (2004) suggested that some other issues that can be seen as barriers to the uptake of ICT by teachers directly influence the level of teacher confidence in the use of ICT in their teaching and learning. In his literature review, he argued that lack of teacher confidence was directly associated with 'the lack of personal access', 'the lack of teacher competence', 'the lack of technical support' and 'fear of things going wrong' in their classroom (*ibid*).

Nevertheless, there are lots of factors that can contribute teachers to develop confidence in the use of ICT. For example, in a study of reporting the factors affecting the teachers in the use of ICT, Cox and her colleagues (1999a) revealed that 'teachers who are already regular users of ICT have confidence in using ICT, perceive it to be useful for their personal work and for their teaching, and plan to extend their use further in the future'. Furthermore, Dawes (1999) proposed four main factors that were important to develop teachers' ICT competence and confidence: "'the exclusive use of a computer', 'teacher training for ICT integration', 'communication using electronic networks' and 'time management'" (p.247). According to results of a survey on the use of ICT, Scrimshaw (2004) also found teacher confidence in using ICT as a crucial factor for enabling them to make successful use of ICT. He suggested that sufficient training and technical support were vital elements for teachers to feel comfortable and enthusiastic about integrating ICT into teaching and learning.

Furthermore, in their study on examining the implications of teacher computer anxiety for teachers' professional development in Australia, Russell and Bradley (1997a) revealed that access to computer was a significant factor for teachers to build their knowledge and confidence in the use of ICT in teaching and learning. According to their findings, teachers who had regular access to ICT resources reported higher level of confidence in the use of ICT. Moreover, teachers who have access to their personal computers are likely to develop confidence and competence about the use of computers. For instance, according to study of evaluation of the Laptops for Teachers Initiative in the UK (Cunningham *et al.*, 2003), teachers reported that:

- 'since receiving their laptops they had become more confident and competent in their ICT use
- teachers who were previously reluctant and inexperienced users of ICT had become more confident and competent with ICT as a whole since receiving their laptop
- they were more eager to use ICT tools in their lessons'.

2.2. School level factors

2.2.1. School leadership

It is widely accepted by many authors that the attitudes of school leadership towards the implementation of ICT in schools is a critical factor affecting the uptake of ICT by teachers (Scrimshaw, 2004; Grainger & Tolhurst, 2005; Tearle, 2003). Fullan (2001) emphasizes the importance of school leadership in establishing appropriate school climate and determining the quality of teaching and learning. He describes school principle as being a person who is "most likely to be in a position to shape the organizational conditions necessary for success, such as the development of shared goals, collaborative work structures and climates, and procedures for monitoring results" (*ibid,* p.83). According to Pelgrum (2001), although teachers play one of the crucial roles in the entire educational change process, school leadership is the most important change agent in the early stages of the implementation of educational innovations.

Positive attitudes from school leadership had been found as an encouraging factor for the successful ICT integration in many studies. Cohen and her colleagues (2004), for example, examined the factors that are effective in the successful implementation of innovative

pedagogical practices in the use of ICT in Israeli schools. According to their findings, the role of school principals was highly important in "leading process, planning and budgeting". In their study, teachers described their principals as "visionaries, role models, encouragers of innovation, open to new ideas and facilitators of teamwork" (*ibid,* p.298). Moreover, in his survey of the factors enabling teachers to make successful use of ICT, Scrimshaw (2004) also emphasized the central role played by the school leadership in facilitating teachers to engage innovative pedagogical practices using technology. According to results of the Becta survey, he found that "support/ positive ICT vision from senior management" and "whole school policies on using ICT across curriculum" were deciding factors for the successful ICT integration at the whole school level (*ibid*, p. 9).

Furthermore, in her interpretive case study, Tearle (2003) examined the use of ICT in a secondary school in the UK in order to explore "features which may have been influential in achieving widespread use of ICT" and "whole school characteristics which may have been supportive in the process of achieving whole school ICT permeation" (p.568). According to results of this study, "strong leadership with high expectations of the school, staff and students", "positive ethos and collaborative culture which promoted learning" and "well motivated and caring staff" had been classified as whole school characteristics which were influential in the ICT implementation process (*ibid*, p.568). In addition, Granger *et al.* (2002), in a case study of four Canadian schools, found several factors that appeared to enable the successful implementation of ICT including teachers' commitment to collegial support and collaboration, 'pedagogically sound' ICT integration, and school principals who inspired teachers to use new technologies in their teaching and learning.

In another Canadian case study, Sheppard (2000) also investigated the factors facilitating or inhibiting the ICT integration into teaching and learning, and the nature of leadership that influence this change process. He identified three types of schools in terms of their success in the ICT integration: innovative, moderately innovative and static schools. He found that teachers and principals appeared to have a lack of vision about the potential of ICT in education in static schools in which leadership tended to be "traditional and hierarchical" (*ibid,* p.14). According to findings of the study, teachers showed little awareness of a need for change in static schools. However, leadership in innovative schools was "more collaborative, supportive of innovation and risk taking, inclusive of others, including teachers, parents and other community partners" (*ibid,* p.7).

2.2.2. Access and quality of ICT resources

In terms of school level factors, many studies have pointed out the significance of access to and quality of ICT resources in schools that has been found as an important factor for the successful uptake of ICT by teachers (Peralta & Costa, 2007; Cohen *et al*., 2004; Pelgrum, 2001). According to Mumtaz (2000), availability of ICT resources affects the decisions of teachers about whether they will use ICT in their classroom or not. Teachers cannot either teach ICT skills or integrate ICT into the curriculum without adequate ICT resources available to them for their use in their teaching and learning. For example, in a case study in four Canadian schools, Granger and her colleagues (2002) revealed that lack of access to ICT resources impeded teaching and learning, and triggered "frustration and resistance in school communities" (p.487). Moreover, according to results of a study conducted in elementary and lower secondary schools from 26 countries, the major obstacle perceived by educational practitioners was the lack of ICT equipments in their schools (Pelgrum, 2001).

However, Jones (2004) suggests that low access to ICT resources does not necessarily mean that there are inadequate resources in the schools. The reason for the lack of access might be due to out-dated and inappropriate organisation of ICT resources or irrelevant educational software for different subject areas. Similarly, Tearle (2004) describes the term 'availability of technology' suggesting that it includes "the quantity, type, reliability of computer, access arrangements and location of equipment" (p.337). For instance, according to a survey by Becta, carried out on examining the barriers to the uptake of ICT by teachers (Jones, 2004), many respondents complained about the poor organisation of ICT resources in their schools which created problems when so many teachers wanted to utilize those resources at the same time. Moreover they reported that although there was so much software available to them for classroom use, they did not find much of this software as appropriate for their teaching that can enhance pupils' learning in the classroom (*ibid*). Squires and McDougall (1995) argue that "the content of educational software and the processes that it supports must be relevant to the curriculum" (p.95). This also supports the idea that "for many teachers, success with ICT was founded on adapting the use of ICT tools to match their existing pedagogy" (Rogers & Finlayson, 2004, p.302).

Moreover, in a survey on secondary schools teachers in Greece, Jimoyiannis and Komis (2006) suggested that access to high quality of educational software and well-developed ICT infrastructure in schools were influential factors on shaping the perceptions of teachers about the use of ICT and their professional development about integrating ICT into their instructions. In another survey carried out by Becta in examining the factors that enable teachers to make successful use of ICT (Scrimshaw, 2004), the enablers, emphasized by teachers, were "access to own personal laptop, availability of high quality resources, full access to software and hardware at all times, access to an interactive whiteboard and effective timetabling of rooms and equipment" (p.9).

Nevertheless, besides the access to ICT that teachers need for their teaching in the classroom, Jones (2004) highlights the personal access to ICT needed by teachers in order to plan and prepare their lessons. Cox *et al.* (1999a) contend that even though teachers have good training opportunities about the use of ICT in teaching and learning, they can come across many difficulties if there are inadequate ICT resources or insufficient time to make preparation and plan for their lessons. Therefore, providing teachers with ICT resources and systems is important in order that teachers can "begin to explore its possibilities so the demands made upon it both increase and evolve" (Scrimshaw, 2004, p.20).

2.2.3. Technical and pedagogical support

Another factor influencing the integration of ICT by teachers at the school level is the level of technical and pedagogical support experienced by teachers in the use of ICT. Teachers who start to use ICT in their teaching need to be supported in terms of technical and pedagogical support. Literature suggests that the lack of technical support may cause some inconvenient circumstances that can impede teachers to carry out their lessons in case of technical problems happening in the classroom (Grainger & Tolhurst, 2005; Condie & Simpson, 2004). In addition, the lack of pedagogical support in the classroom situations can be another impeding factor for teachers using ICT in their teaching (Peralta & Costa, 2007). Tearle (2004) suggests that besides knowing how to use ICT materials, school staffs need to understand "the pedagogy required to use them to meet teaching and learning needs" (p.336). Thus, besides technical support, it is also suggested to provide teachers with enough pedagogical support to enable successful innovative ICT practices.

According to Jones (2004), teachers who are deprived of available technical support are likely to avoid using ICT in the classroom. From the responses to the Becta survey, many respondents appeared to complain about the lack of technical support needed in the use of ICT in their classroom. According to teacher comments, “lack of technical back-up” and “expertise when things go wrong” had been found as important barriers to the uptake of ICT by them (*ibid*, p.16). Furthermore, in a survey investigating the views of the primary and secondary teachers about the ICT initiatives in Scotland (Condie & Simpson, 2004), teachers identified a number of barriers that need to be tackled if ICT was to be used in the classroom effectively. Teachers acknowledged that lack of technical support, lack of time to become familiarized with ICT, and inadequate ICT knowledge and skills were the impeding factors affecting the ICT integration in their schools. They argue that in order to overcome these barriers, it must be ensured that teachers have reliable and well-coordinated technical support for the successful use of ICT.

In another survey by Becta (Scrimshaw, 2004), teachers attached importance to the high level of on-site technical support, as one of them commented that “for a Humanities faculty where knowledge of hardware is, at best, limited, it is a security blanket to know that there are technicians available ‘on the spot' to remedy hardware failings” (p.10). In addition, in their case studies in Israeli schools, Cohen et al. (2004) found computer coordinators as a crucial factor influencing the ICT integration into schools. According to their findings, computer coordinators played two important roles; “one, as technical and pedagogical coaches and assistants in solving problems, and two, as leading figures in implementing the innovation, especially in cooperation with staff members” (*ibid,* p.299). Furthermore, they argued that technical support is more important than the number of computers in schools. They suggested that “full support in an environment with less computers is more effective than having more computers without enough support” (*ibid*, p.305).

2.2.4. School ethos and collaborative culture

Many studies have found school ethos and collaborative culture to be an influential factor in the integration of ICT in either supporting or impeding the change process (Tearle, 2004; Hennessy *et al.*, 2005). It is widely accepted that although teachers have appropriate training opportunities and enough knowledge and skills for the use of ICT in their

teaching, it is unlikely to have a successful integration of ICT into their teaching without a positive school ethos and collaborative culture.

Besides change at the individual level, Fullan (2001), for example, emphasizes the importance of organizational change in order to provide supportive and stimulating environment to encourage teachers to change their practices. However, he argues that most strategies for educational innovations have concentrated on only the structures of schools, formal requirements and other activities (such as teacher training sessions), rather than existing culture of schools which requires new values and practices for the success of the educational innovation (*ibid*). Thus, he suggests that if the changes, brought by educational innovation, are to become constant, teachers and principle will need not only to 'restructure' current school schedules and curriculum, but also 'reculture' their school to create and foster purposeful learning communities (Fullan, 1993; 2001).

When we look at the literature, we can easily see that many authors recognize the importance of school ethos and culture in creating the circumstances in which educational innovations may flourish and become constant. Adey (2004) highlights the importance of school environment for the educational change. He claims that "teachers rarely if ever are able to make real changes in their pedagogy unless the school environment in which they find themselves is, at the very least, tolerant to innovation" (*ibid*, p.165). Furthermore, Day and Sachs (2004) emphasize the importance of the school culture for teachers' learning. They suggest that "just as conditions in the classroom affect the ability of teachers to provide the best learning opportunities for students, so the school culture provides positive or negative support for its teachers' learning" (*ibid*, p.10).

Cohen *et al.* (2004), in a case study on examining the factors affecting the implementation of innovative pedagogical practices, found a positive link between the 'innovation history' of the school and the level of collaboration and support among teachers in relation to innovation. According to findings of this study, teachers demonstrated high level of collegial support and engagement in innovative practices where their schools had a long and rich 'innovation history' and a positive vision and clear goals regarding the ICT integration. Moreover, in another case study which examined the whole school characteristics influencing the ICT integration into a UK secondary school, Tearle (2004) identified a number of factors supporting the change process, such as "strong whole school leadership", "the culture of the school as one which promoted and encouraged learning and

collaboration" and "the change orientated nature of the whole school and the motivation of individuals within it" (p. 345).

Nevertheless, Day and Sachs (2004) suggest that the isolation of teachers from their colleagues hinders them to discuss, think about and try out new practices in a collaborative way. Moreover, Swafford (1998) ascribes the teachers' failure in the implementation of new ideas to having no support from their colleagues when they attempt to learn new knowledge and skills, and change their practices. And, Kelchtermans (2004) describes collegiality as the cure of all 'diseases' in schools. He maintains that "the quality of collegial relations among staff members in school as well as their collaboration are widely acknowledged as very powerful determination of school development, successful implementation of innovations, and job satisfaction etc" (*ibid*, p.222). Similarly, Granger *et al.* (2002), in a case study of four Canadian schools, found supportive and collaborative relationships among teachers as highly useful factor for the ICT integration into teaching and learning. They emphasized the importance of collaboration in the use of ICT, as "teachers needed each other for team teaching and planning, technical problem-solving assistance and learning" (*ibid,* p.486). Furthermore, Becker and Riel (2000), in a national survey examining the link between professional engagement and teaching practice including the use of ICT, found that "teachers who regularly participate in professional interactions and activities beyond their classroom teach in different ways than teachers who have minimal contact with their peers or profession" (p.2).

Spark and Hirsh (1997, cited in Bolam & McMahon, 2004, p.34) argue that to have a sustainable implementation of educational reform, there is a need for a new form of comprehensive professional development that affects "not only the knowledge, attitudes and practices of individual teachers, administrators and so on, but also cultures and structures of organisations in which they work". To sum up, the use of ICT by teachers is undoubtedly affected by the organisation in which they work. Thus, it is very important to take into account culture and ethos of the school in which teachers work and try to implement educational innovation, such as ICT.

2.3. National level factors

2.3.1. Professional development and training

Many studies have demonstrated that professional development of teachers and appropriateness of ICT training they receive are important factors influencing the success of the ICT integration into teaching and learning (Jimoyiannis and Komis, 2007; Valcke et al., 2007; Younie, 2006; Grainger and Tolhurst, 2005). A report by UNESCO (2005) suggests that "teachers are a key enabling factor in improving the quality of education. The evidence of this and many other reports is that teachers are critical to any reforms designed to improve quality" (p.161). Therefore, preparing teachers for the challenges that they would come across in their careers is very crucial in determining the quality of teaching and learning, as well as success of educational innovations, such as integration of ICT into schools.

Jones (2004) argues that unsuitable training approaches can lead to low-level use of ICT by teachers. In his literature review, he suggests three factors drawing on the previous literature that affect the ICT training programmes: "lack of time for training", "lack of pedagogical training" and "lack of skills training" in the use of ICT (ibid, p.9). Furthermore, the contents and sources of ICT training programmes have been also seen as an important factor in the implementation of pedagogical innovations using ICT (Cohen *et al.,* 2004). According to Cohen and her colleagues (2004), relevance of ICT training that matches teachers' needs and the accessibility of ICT resources to the teachers during the training play a key role in determining the success of ICT training programmes. For example, in a study of evaluating the ICT training programmes in Flanders, Valcke and his colleagues (2007) examined the relevance of content and format of current ICT training programmes, and the coordination of these programmes with the school ICT policies. They conducted interviews with the respondents from primary, secondary and adult education schools. According to their results, although respondents did not see any problem in the content of training programmes, when considering the more challenging and advanced uses of ICT, they reported that current ICT training programmes did not meet the demands of ICT policies in their school. In addition, respondents suggested that ICT training should

have been organised during school hours in their schools, and had to be associated with "the specific questions, needs or the problems of the own school" (*ibid,* p.805). Moreover, they highlighted the importance of flexible training that provides choices and opportunities "for teachers who are in different stages of ICT-literacy" (*ibid,* p.805).

Younie (2006) analysed the documents and reports on the implementation of ICT in education in the UK. According to her analysis, one of the problems in the implementation of ICT was the lack of specialist ICT training which was required by teachers in order to be an expert in the use of ICT in their teaching. She also identified that the level of access to ICT resources and the support provided by school leadership played an important role in the success of ICT training programmes (*ibid*). Furthermore, Grainger and Tolhurst (2005) conducted a study in order to examine the nature, relevance and usefulness of ICT training in Australia. According to recommendations made for the future ICT training programmes, it was suggested that the material provided in training programmes needs to be more relevant for teachers, and ICT training needs to focus on teaching and learning practices rather than "logistical or conceptual ideas about how the system should be used" (*ibid*, p.8). Moreover, according to the findings of Becta survey (Jones, 2004), the lack of time for training was also found as a barrier for the effective professional development of teachers in the use of ICT, as one teacher mentioned that "[There is] not enough time to practise and receive meaningful training using ICT across the curriculum" (*ibid,* p.9).

Nevertheless, many authors recognize the importance of pedagogical training in the use of ICT. According to Cox and Marshall (2007), the aim of ICT training programmes should not be only to train and support teachers in the uses of ICT materials, but "to challenge teachers' fundamental beliefs about how to teach their subject and how specific ICT resources can enhance and fundamentally change the way in which their students learn" (p.68). Thus, they suggest that training programmes should enable teachers to learn about new teaching and learning strategies, new types of 'knowledge presentation' and ability of integrating ICT into the curriculum and classroom practices (*ibid*). Similarly, Borko and Putnam (1995) suggest that teacher development programmes must enable teachers to develop a range of knowledge which is relevant to teachers' instructional practices, including subject matter knowledge, general pedagogical knowledge and more importantly pedagogical content knowledge (PCK). They describe general pedagogic knowledge as "knowledge of various strategies for creating learning environments and conducting

lessons; strategies and arrangements for effective classroom management; and knowledge and beliefs about learners, how they learn, and how that learning can be fostered by teaching" (ibid, p.39). Therefore, it is important for ICT training programmes to take into account the teachers' pedagogy so that technology can play a significant role in improving teaching and learning.

2.3.2. National ICT policies

As the importance of ICT has been recognized by almost every society, ministries of national education from all over the world have set up national ICT goals and policies in order to improve their education system (Jones, 2003). However, preparing policies and programmes to produce successful educational outcomes is a serious challenge that policy makers face, since it requires careful planning and decision making, adequate financial support, encouragement and commitment to the implementation process. Pelgrum (2001) describes ICT in education as "an area which is in turmoil and in which many participants play a role" (p.164). Hence apart from forces which affect the integration of ICT into education at the micro- and meso-level, "at the macro level, classroom practices can be influenced by state or national policies and international trends in areas such as curriculum, assessment, professional development and communication" (Kozma, 2003, p.14).

As it is evident in the literature, national ICT policies and implementation strategies have been found as a crucial factor influencing the integration of ICT into schools (Cox & Marshall, 2007; Younie, 2006; Kozma, 2003). Mumtaz (2000) describes policy makers in the implementation of ICT as one of the three interlocking frameworks that needs to be addressed for the successful ICT integration. For instance, in a study investigating the factors influential in the implementation of innovative pedagogical practices, Cohen and her colleagues (2004) found policy makers at the ministry of education and in the municipalities as a crucial factor involved in the integration of ICT into teaching and learning. However, they found different results from different schools. While many schools reported that "the ministry was open to the innovation, backing it with moral, pedagogical and financial support", some of them described the ministry of education as a partner in planning and enacting the innovation, and other schools highlighted the difficulties created by the ministry of education (*ibid,* p.299). Furthermore, in their multiple case study research which was carried out in five different European countries,

Peralta and Costa (2007) emphasized the importance of the role played by school leadership, and national and regional ICT policies in supporting the pedagogical use of ICT in teaching and learning.

Nevertheless, according to ICT impact report published by European Schoolnet (2006), it is suggested that even though educators are willing to integrate ICT into teaching and learning activities, in some countries education systems can constitute a barrier to the implementation of ICT. Because of this, it is important how educational reforms are being implemented, as "implementation is a complex procedure, not a direct translation from government policy to practice" (Younie, 2006, p.385). The literature on this issue suggests that the structure of education system has a significant effect in determining the success of the innovation, such as integration of ICT into schools. Jones (2003), for instance, makes a comparison between centralized and decentralized education systems about their effects on the educational innovations. He suggests that while highly centralized education systems can 'achieve internal consistency by expressing a coherent vision in which the problem facing schools and society in general are clearly articulated and by proposing ICT solutions that address these problems', in federal or decentralized education systems "due to fragmentation of educational governance and the lack of coordination between levels, reforms may be formed but may not be consistent" (*ibid*, p.192). In other words, he emphasizes the applicability of national policies since they are more consistent than local policies.

However, in contrast to above comparison, many studies have found local policies more effective in supporting and sustaining the innovation than national policies (Jimoyiannis & Komis, 2007; Younie, 2006; Cohen *et al*., 2004). For example, Younie (2006) analysed the research and evaluation studies about national initiatives concerning ICT in education in the UK. In her paper, she argued that "there was an identifiable gap between the legislative requirements and the reality of what was happening in schools" (*ibid*, p.387). She identified five critical areas that were considered problematic in the implementation of ICT: management, funding, technology procurement, ICT training and impact on pedagogy. According to her, "government policy has to be filtered through macro, meso and micro levels, as policy is mediated through national agencies (macro), regional agencies (meso) down to individual schools and teachers at the micro level" (*ibid,* p.385). In other words, she suggests that the national ICT policies and strategies need to be

modified according to local needs and requirements of each schools and teachers who might have different conditions. In addition, in their case studies in Israeli schools, Cohen and her colleagues (2004) found local policy more effective than national policy in supporting and encouraging the implementation of innovative pedagogical practices in the use of ICT.

In the literature, there are also many recommendations about overcoming the problems created by ICT policies. In their study, Jimoyiannis and Komis (2007), for example, argue that "top-down imposed policy decisions and technocentric models for ICT adoption appear to be unresponsive to teachers' perspectives, priorities and classroom or general professional needs" (p.170). They suggest two important points that must be taken into consideration by policies on ICT in education:

- "helping teachers adopt ICT not as a trend in our modern technological society but as an efficient teaching and learning tool" and
- "encouraging teachers to develop a new educational culture by integrating self-development in ICT in education into their professional development planning" (*ibid,* p.170).

Similarly, Rudd (2001, p.219) contends that "ICT projects cannot simply be 'bolted on' or 'imported' into school development or school improvement processes". He suggests schools to produce their own ICT development plans which are linked to the Education Development Plan prepared by Local Education Authority (LEA). Furthermore, in Quebec, Canada, a strategy was developed by ministry of education to assist schools in order to develop their own ICT plans (Richardson, 2000). The ministry was suggested to provide schools with:

- "access to relevant official documents published by Education Ministry
- guidelines for the acquisition of equipment (budgetary regulations and admissible purchases)
- email contact for schools with experts in the field
- a complete guide on drawing up a school plan
- a repertory of over 100 school plan-related comments
- examples of plans for integrating ICT into teaching establishments" (*ibid,* p.5).

CHAPTER THREE

3. RESEARCH METHDOLOGY

3.1. Introduction

As mentioned in chapter one, Turkish Government has launched many initiatives regarding the curricular and structural reforms to accelerate the integration of ICT into primary school system. For primary school teachers, these initiatives mean a major change in their teaching and learning, since new knowledge and skills need to be learnt, new materials need to be managed, but more importantly new beliefs and understanding about the potential of ICT need to be acquired. On the other hand, as it is obvious from many studies, there are many factors influencing this change process as well as teachers as being a crucial actor in these initiatives. Therefore, in this study, I aimed to explore the Turkish primary school teachers' perceptions of the factors which help or hinder the integration of ICT into teaching and learning by them.

In this chapter, after describing the methodological approach that I have selected for this study, I shall give some information about the research instruments used in this study. Then, I will describe the sample of the study, and focus on data collecting process and other issues related to access to participants. Finally, I shall highlight the some issues concerning the ethics of the study.

3.2. Methodological approach

In this study, a mixed methods approach was used in order to collect both quantitative and qualitative data on the sample of primary school teachers in Turkey. According to Cohen et al. (2000), qualitative and quantitative research studies are frequently being conducted in educational context. However, while quantitative methods (for example, questionnaires) are seen as good at gathering information in breadth from a large number of participants, on the other hand, qualitative methods (for example, interviews) are usually used to obtain information in depth from a small number of people (Muijs, 2004). Besides this difference, whereas the information obtained from quantitative methods tends to be more descriptive, the use of qualitative methods provides more exploratory

information to the researcher (Munn & Drever, 1999). Thus, due to the nature of this study, I decided to use both questionnaire and interview, in order to provide a wide and direct access to the opinions of the primary school teachers who are the focus of this study.

Firstly, I designed a questionnaire to collect data from the sample of subjects drawing on the previous research studies (Scrimshaw, 2004; Jones, 2004; Cox *et al*., 1999a; Williams et al., 1998). There are many advantages of using questionnaire for the researchers, such as efficient use of time, anonymity and the possibility of a high return rate (Munn & Drever, 1999). In addition to these advantages, McMillan and Schumacher (2001) explain another advantage of using questionnaire which is very important for this study. According to them, questionnaire contains a variety of instruments which enable subjects to disclose their *reactions, attitudes* and *beliefs* through answering written questions (*ibid*).

Secondly, I used an interview in this study which is seen as the most commonly used method for collecting qualitative data (Fielding, 1993). According to Patton (1990, cited in Merriam, 1998, p.72), "the purpose of interviewing is to allow us to enter the other person's perspective" (p.196). Thus, in order to explore the teachers' perceptions of the factors affecting the integration of ICT into teaching and learning, I conducted interviews with the primary school teachers. I chose a semi-structured interview, as "this format allows researcher to respond to the situation at hand, to the emerging worldview of the respondent, and to new ideas on the topic" (Merriam, 1998, p.74).

3.3. Sample of the study

In this study, although it is hoped to come to a conclusion that would be appropriate to any primary schools in Turkey, I limited the study to the Anatolian side of Istanbul and took a random sample within this area, since it would be unrealistic to carry out this research across the country or with the entire primary schools in Anatolian side of Istanbul in the period of time available. Therefore, in total four primary schools were represented in the sample of this study with 42 primary school teachers from grade 1 to 5. First school (S1), selected for this study, had 1400 students and 48 teachers with an ICT coordinator working part-time. There were two ICT labs and 54 computers with wireless internet connection available to the teachers and students for their use. Second school (S2) had over 900 students and 32 teachers. This school had not got any ICT coordinator, but technical support was provided from outside the school. It had also one ICT lab and 30 computers

with the limited access to internet due to technical problems. It was a financially disadvantaged school and purchasing ICT materials generally depends on the contribution of parents and voluntary organizations. Third school (S3), which is located outer neighbourhoods of Istanbul, had over 1000 students and 38 teachers with a permanent ICT coordinator working part-time. This school had got two ICT labs and 50 computers with wireless internet connection for the use of teachers and students. Last school (S4) had over 1100 students and 40 teachers. It was the most fortunate schools in this sample, as it had three ICT labs and 80 computers with wireless internet connection. I have been told that, in this school, ICT equipments were mostly purchased by the contribution of parents and voluntary organizations, along with the MONE.

3.4. Data collection

In order to approach the primary school teachers to conduct my questionnaire and interview, I sought permission from the primary school principals. I got permission from four primary schools in the Anatolian side of Istanbul. After getting permission, teachers were given the information sheet and enough time to read it before being asked to agree to participate in this study. Although 50 primary school teachers volunteered to take part in the questionnaire survey, only 42 of them returned the completed forms. In the questionnaire, teachers were asked to indicate whether they agree, disagree or are neutral with a set of 45 close-ended statements that fall under three different sections (see, Appendix A). Section 1 included 17 items which sought the teachers' beliefs and attitudes toward the use of ICT, and their knowledge and skills in the use of ICT in teaching and learning. Second section addressed the questions on school leadership, school culture and ethos, access and quality of ICT resources, and technical and pedagogical support concerning the use of ICT. Finally, the last section contained 13 items about the professional development and training in the use of ICT and national ICT policies.

As mentioned above, in order to answer the research questions in more depth, interviews were also conducted in this study. Teachers were asked in the questionnaire whether they wish to volunteer to be interviewed or not. However, only four of them volunteered to take part in the interview. All teachers taking part in the interview were asked to sign consent form. Interviews were conducted in teachers' free time, lasting about 10 to 20 minutes in their schools. The interviews were tape-recorded and transcribed for analysis (see,

Appendix B, C, D, E,). As it was a semi-structured interview with each teacher individually, all teachers were asked the same open-ended questions and a number of possible follow-up questions which gave the researcher more flexibility in seeking teachers' opinions. Nevertheless, it must be accepted that the opinions presented by the primary school teachers during the interview cannot be expected to lead to firm conclusions, since they cannot be accepted as a representative of the whole group of 42 primary school teachers. However, I hope that interview will allow research to gain in-depth insight into how teachers perceive and understand the factors which were influential on the integration of ICT in teaching and learning.

3.5. Ethical issues

As it is important for any research to be ethical, this research was conducted considering the ethical issues. Thus, this study was designed to be confidential and anonymous in order to respect the participants' rights and privacy. Participation in this research was completely voluntary, and all participants were informed about the purpose of the study before deciding to partake in this study. All participants completing a questionnaire were informed that returning the completed questionnaire implies consent to participate. However, subjects participating in the interview were asked to sign a consent form and were informed that they had the right to withdraw at any stage of this study. Questionnaires were distributed to the teachers in an envelope in their school and returned to the researcher in a sealed envelope anonymously. The interviews took place in the school with the permission of school principle in teachers' free time. Interviewees were informed about how their personal information and responses would be used in this study. Questionnaires and interview transcripts were only identifiable by a unique code and kept private at all times. There was no risk, since all data was anonymised by changing all names of teachers and schools taking part in this research in order not to be identified from the research.

CHAPTER FOUR

4. FINDINGS

This chapter includes the presentation of the findings of this study. Data obtained from questionnaires and interviews shall be presented in separate sections.

4.1. Questionnaire

The questionnaires were returned by 42 out of the 50 primary school teachers who received them, giving a return rate of 84%. Table 1 illustrates the demographic data of the teachers obtained from questionnaires, such as gender, age, years of teaching experience, years of ICT experience, and whether they use ICT in their teaching and learning or not. According to findings, two third of teachers were female and one third of teachers were male in the sample, which might be due to there being more female teachers in Turkish primary schools nationwide.

Table 1: Primary school teachers profile (n=42)

		Number	Percent (%)
Gender	male	14	33.3
	female	28	66.7
Age	20-30 years old	10	23.8
	31-40 years old	23	54.8
	41+ years old	9	21.4
Teaching experience	1-5 years	3	9.5
	6-10 years	15	35.7
	more than 10 years	23	54.8
ICT experience in teaching and learning	less than 1 year	3	7.1
	1-5 years	26	61.9
	more than 6 years	5	11.9
	no experience	8	19.0
Do you use ICT in your teaching and learning?	yes	30	71.4
	no	12	28.6
Access to computer	Home	39	92.9
	Teachers' common room	32	76.2
	Computer lab	24	69.0
	Classroom	22	52.4
	Library	11	26.2

Over half of the respondents (54.8%) were 31 to 40 years old, while 23.8% of teachers were 20 to 30 years old and 21.4% of them were more than 40 years old, which could enable making a comparison in the use of ICT between different age groups. More than half of the teachers (54.8%) indicated that they had more than ten years of teaching

experience, whereas 35.7% of them had 6 to 10 years and just 9.5% of them had 1 to 5 years of teaching experience. While 11.9% of the respondents had been using ICT in teaching and learning for over 5 years, majority of them (61.9%) stated that they had been using it for 1 to 5 years, and minority of them (7.1%) had been using ICT for less than one year. Nearly three in four teachers (71.4%) pointed out that they were currently using ICT in their teaching and learning. However, surprisingly, even though only 19% of teachers mentioned that they had no experience in the use of ICT in teaching and learning, 28.6% of the respondents stated that they do not use ICT in their classroom. In term of access to computers, high proportion of teachers (92.9%) noted that they had access to computer at home. However, whereas almost three in four teachers stated to have access to computers in both teachers' common room (76.2%) and computer labs (69%) in their school, only one in two teachers (52,4%) reported that they had computers in their classrooms.

- **Use of ICT by teachers**

In order to determine teachers' ICT usage patterns, teachers were asked to state what kind of ICT resources they use for what purposes (see, Figure 1). According to results, Internet, databases and word-processing were found the most popular ICT resources among teachers.

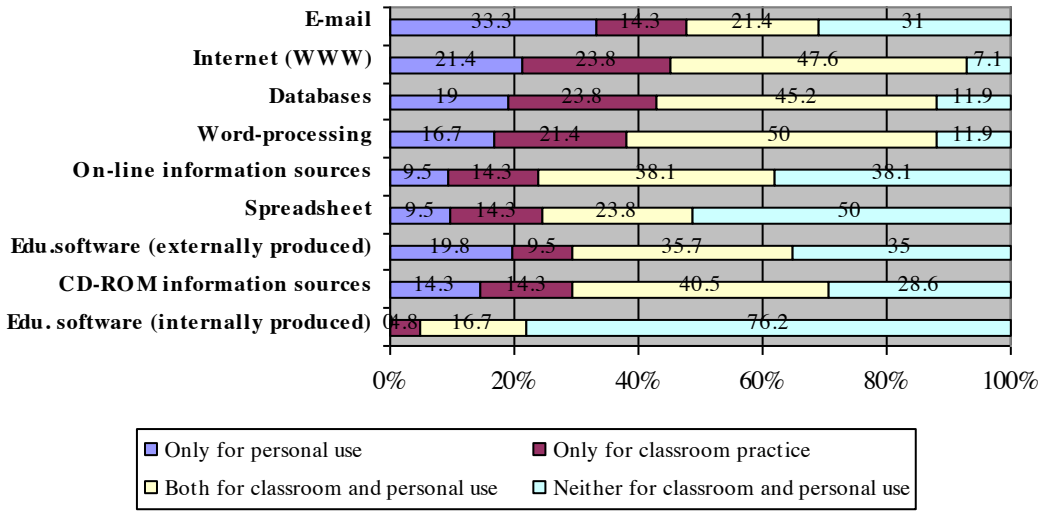

Figure 1: Use of ICT resources by primary school teachers

Nearly half of the respondents reported that they use word-processing (50%), Internet (47.6%) and databases (45.2%) for both classroom practice and personal use. E-mail (33.3%) has the most frequent ICT resource that was used for only personal purposes. A

striking feature of the data, which can be seen from Figure 1, is the lowest use of educational software which is produced by teachers. 76.2% of the respondents said that they do not use internally produced software, while just 35% of them did not use externally produced software. It can be said that this result has some implications about the capability of teachers to produce ICT materials to use for classroom practices.

As can be seen from Figure 2, teachers were also asked to indicate how often they used ICT in different primary school lessons. Mathematics was rated by respondents as the most popular lesson in which ICT was being used. Over half of the respondents (52.4%) pointed out that they use ICT in mathematics lessons weekly and 14.3% of them use it monthly. This can be explained due to the fact that there are many software programmes about mathematics that teachers could obtain easily either online or on CD-ROM.

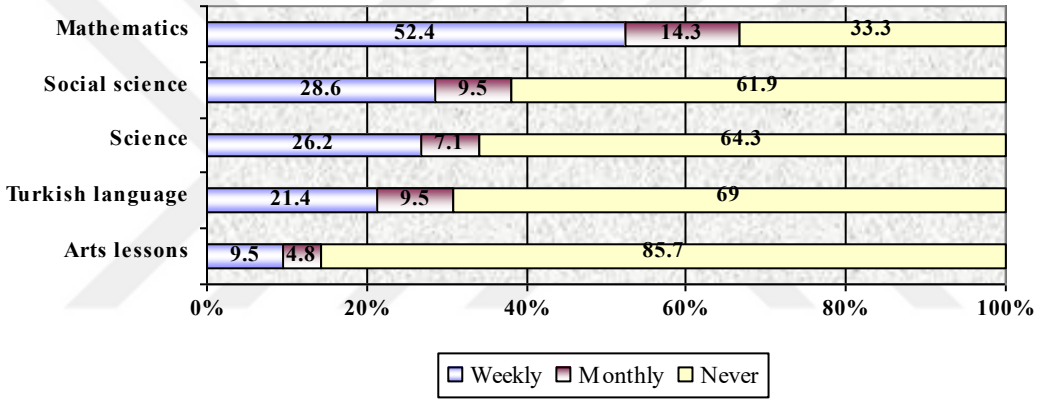

Figure 2: Use of ICT in different lessons by primary school teachers

On the other hand, arts lesson was the least popular one among others, as 85.7% of teachers reported that they had never used ICT in art lessons. However, 69% and 64.3% of the respondents indicated that they had never used ICT in Turkish language and science lessons respectively. Becker (2001) contends that ICT usage of teachers for instructional purposes differs in terms of different subject areas. However, this situation again could be explained about not having enough ICT materials which are compatible with the curriculum content concerning these subjects.

- **Teachers' beliefs and attitudes**

In order to identify the Turkish primary school teachers' beliefs and attitudes about the use of ICT in teaching and learning, teachers were asked to indicate whether they agree,

disagree or are neutral with the 10 closed-ended statements. From their responses to the questionnaire, teachers appeared to have a positive attitude towards ICT in general.

Table 2: Attitudes and beliefs of Turkish primary school teachers about ICT (n=42)

	Items	Agree		Disagree	
		%	n	%	n
1	I am enthusiastic about using computers.	90.5	38	9.5	4
2	I feel quite confident when I use ICT in my teaching.	50.0	21	40.2	17
3	I think computers are an important part of teaching.	76.2	32	19.0	8
4	I cannot see any benefits of computers in education.	7.1	3	88.1	37
5	I feel ICT helps pupils acquire new knowledge effectively.	76.2	32	16.7	7
6	I really want to know more about developing my skills in ICT.	92.9	39	7.1	3
7	I need to develop my skills and knowledge for the pupils' benefit.	64.3	27	23.8	10
8	I am only interested in developing my skills and knowledge for personal purposes.	26.2	11	59.5	25
9	I find using ICT time consuming.	26.2	11	66.7	28
10	ICT helps me to cut down my preparation time.	73.8	31	21.4	9

As can be seen from Table 2, majority of them (90.5%) stated that they were enthusiastic about using computers. On the other hand, despite this finding, when the respondents were asked how they feel while using ICT, half of the teachers (50%) agreed that they feel quite confident in the use of ICT in their teaching and learning. There are several studies stressing the importance of ‘teachers’ confidence’ and ‘computer anxiety’ that have been found very influential in determining whether teachers use ICT in the classroom or not (Jones, 2004; Bosley &Moon, 2003). However, in this study, we can argue that ‘computer anxiety’ can be seen as a barrier nearly for the half of the teachers in the sample for the integration of ICT into schools.

Almost three in four teachers (76.2%) perceived ICT as an important part of teaching and learning process. On the other hand, just minority of respondents (7.1%) agreed that they cannot see any benefits of computers in education. Moreover, while 76.2% of teachers felt that ICT helps pupils to acquire new knowledge effectively, only 16.7% of respondents opposed this idea. Furthermore, as shown in Table 2, approximately three in four respondents (73.8%) claimed that ICT helps to cut down their preparation time, while just 26.2% of teachers described ICT as a time consuming. Another finding from questionnaire was that majority of the respondents (92.9%) expressed positive views regarding developing their knowledge and skills in ICT. However, while 64.3% of teachers wanted to develop their knowledge and skills for the pupils’ benefit, on the other hand, 26.2% of them stated that they were only interested in developing skills and knowledge for the personal purposes.

- **ICT knowledge and skills**

As shown in Table 3, teachers were also asked to mention their knowledge and skills in the use of ICT in teaching and learning. The results revealed that although majority of teachers seemed to have positive views regarding the use of ICT in education, only small percentage of teachers felt their ICT skills and knowledge were sufficient.

Table 3: Turkish primary school teachers' knowledge and skills about the use of ICT (n=42)

	Items	Agree		Disagree	
		%	n	%	n
11	I feel my skills and knowledge in ICT are adequate.	21.4	9	78.6	33
12	I know the basics of ICT but that is all.	42.9	18	45.2	19
13	I do not have the appropriate skills to use it effectively in my teaching.	69.0	29	26.2	11
14	I do not have enough pedagogical knowledge in the use of ICT.	57.1	24	28.6	12
15	I use ICT effectively both in my teaching and for myself.	23.8	10	66.7	28
16	I use ICT effectively myself but I'm not sure how to teach the pupils with ICT.	61.9	26	31.0	13
17	I find it easy to select appropriate ICT resources for my teaching.	35.7	15	52.4	22

According to the findings of the study, only one in four teachers (23.8%) stated that they could use ICT very efficiently both in their teaching and for personal purposes. However, seven out of ten respondents (69%) reported that they did not have appropriate ICT knowledge and skills which were enough to use ICT in a classroom situation effectively. Similarly, more than half of the informants (61.9%) reported that although they considered themselves as an effective ICT user for themselves, they acknowledged that they were not quite sure how to teach students through using ICT. This view might be explained by the lack of teachers' pedagogical content knowledge, as 57.1% of them reported that they did not have enough pedagogical knowledge and skills related to use of ICT in the classroom. Many studies highlighting the importance of teachers' pedagogical knowledge support this view that the lack of pedagogical knowledge and skills has been found as an important barrier for teachers to integrate ICT into their teaching and learning. However, this situation may be a reflection of the insufficient ICT training teachers had received which will be discussed later on this chapter. However, only one in three teachers (35.7%) considered themselves as capable in choosing the ICT resources which are appropriate to their teaching. It is also widely accepted by many authors that evaluation of ICT resources from the pedagogical perspective is also very crucial for making successful use of ICT by teachers in the classroom.

- **School leadership**

In order to reveal the attitudes of school leadership regarding the integration of ICT in schools, primary school teachers were asked to express their views on several important issues (see, Table 4). When the respondents were asked to indicate their school principal's attitude towards the ICT in education, almost three in four teachers (73.8%) thought that their school principals had a positive ICT vision, while just 16.7% of them expressed negative feeling about this statement.

Table 4: Attitudes of school administration towards the use of ICT (n=42)

	Items	Agree		Disagree	
		%	n	%	n
18	Our school principal has a positive ICT vision.	73.8	31	16.7	7
19	Our school administration supports us for our PD in the use of ICT.	54.8	23	45.2	19
20	I have enough support from my school administration.	66.7	28	31	13

Furthermore, while 66.7% of the teachers reported that they had enough support from school administration regarding the use of ICT, nearly one in three teachers (31%) complained about the lack of support from the school administration. The issue of the attitudes of school administration towards teachers' professional development in ICT was also raised in another statement. Approximately half of the teachers (54.8%) agreed that they had enough support concerning their professional development in ICT from the school administration.

This issue is crucial one, as many studies have stressed the importance of the role played by school administration in the implementation of ICT in schools. According to findings of our study, school administrations' attitudes towards the ICT integration had been found very positive by primary school teachers in general. However, considering highly centralized national education system in Turkey, it must be noted that positive views or support from school administration and principal can be effective in the implementation of ICT in primary schools to some extent in comparison with its counterparts in different countries such as UK.

- **School culture and ethos**

Besides attitudes of school administration, it is very important to take into account culture and ethos of the school in which teachers work and try to implement educational innovation, such as ICT. Adey (2004) emphasizes the importance of school environment for the educational change. He claims that "...teachers rarely if ever are able to make real changes in their pedagogy unless the school environment in which they find themselves is, at the very least, tolerant to innovation" (*ibid*, p.165). Therefore, as shown in Table 5, teachers' opinions were also sought in order to determine the effects of the culture and ethos of their schools on the integration of ICT in teaching and learning.

Table 5: Culture and ethos of Turkish primary schools in the use of ICT (n=42)

	Items	Agree		Disagree	
		%	n	%	n
21	My current school has a positive attitude to ICT use.	85.7	36	11.9	5
22	My current school provides opportunities to work and share with other teachers.	81.0	34	16.7	7
23	Current school curriculum is relevant to use of ICT in teaching and learning.	71.4	30	26.2	11

When asked whether there was a positive attitude to the use of ICT in their school, majority of the teachers (85.7%) claimed to have a positive atmosphere concerning ICT in their schools. According to results, nearly four in five teachers (81%) pointed out that their current school provides teachers with opportunities to work and collaborate with each other. Furthermore, new primary curriculum was perceived by the 71.4% of respondents as an encouraging factor for the use of ICT in teaching and learning.

- **Access and quality of resources**

As Fullan (2001) emphasizes the importance of new materials that teachers would experience if they were to implement a new learning approach, ICT resources in schools have been found as a crucial factor that affect the integration of ICT by teachers in many studies. As can be seen in Table 6, teachers' views were sought to investigate the quantity and quality of ICT resources in the primary schools, and the availability of these resources to the teachers to use in their teaching and learning.

Table 6: Access to ICT resources in the school (n=42)

	Items	Agree		Disagree	
		%	n	%	n
24	There is a lack of ICT resources in my school.	76.2	32	19.0	8
25	I have full access to ICT resources at all times in my school.	35.7	15	61.9	26
26	Effective timetabling of rooms and equipments are available at all times.	33.3	14	64.3	27
27	High quality ICT resources are available in my school.	21.4	9	73.8	31

28	There are poor quality of resources and inappropriate organisation of ICT resources in my school.	73.8	31	23.8	10

According to the responses to the questionnaire, there was a negative correlation between access to and quantity of ICT resources at schools. While 76.2% of teachers indicated that there was a lack of ICT resources in their schools, 61.9% of them stated that they did not have access to ICT resources at all times in their school. Another challenge to be faced by teachers was the difficulty in booking ICT labs and low ratio of computers to students. In the present study, 64.3% of respondents indicated that effective timetabling of ICT rooms and their equipments were not available to them at all times. Another result from the questionnaire was that almost three in four teachers (73.8%) reported that there was a poor quality and unsuitable organization of ICT resources in their schools, while just 21.4% of teachers thought that high quality ICT resources were available to them in their schools.

- **Technical and pedagogical support**

Primary school teachers were also asked to express their views on the series of statements about the characteristics of technical and pedagogical support received by them related to the use of ICT in a classroom situation. According to results (see, Table 7), approximately three in four teachers (71.4%) felt to be deprived of the technical support in the use of ICT.

Table 7: Technical and pedagogical support in the use of ICT (n=42)

	Items	Agree		Disagree	
		%	n	%	n
29	I do not have enough technical support in the use of ICT.	71.4	30	28.6	12
30	I need a pedagogical support to use ICT in my teaching.	64.3	27	26.2	11
31	I have an onsite technical support from ICT coordinator in the use of ICT.	19.0	8	76.2	32
32	Our ICT coordinator does not have enough pedagogical knowledge to help me use ICT in my teaching.	73.8	31	21.4	9

Furthermore, primary school teachers highlighted the importance of on-site technical support in the use of ICT. However, findings from the questionnaire suggest that only minority of respondents (19%) had onsite technical support in the use of ICT in their schools. Besides not having enough technical support from ICT coordinator, almost three in four teachers (71.4%) reported that ICT coordinators did not have enough pedagogical knowledge and skills as much as required to provide them with pedagogical support. This

point is very crucial, as 64.3% of teachers stated that they needed a pedagogical support to use ICT effectively in their teaching and learning.

- **Professional development and training**

In order to evaluate the effects of ICT training courses on teachers' professional development in the use ICT, the important set of questions addressed the ICT training programmes provided by MONE, (see, Table 8). The results revealed that high proportion of teachers (90.5%) in the sample received an in-service training in the use of ICT. However, 61.9% of the respondents felt that ICT training courses which they had attended was not appropriate to their teaching in the classroom, and three in four teachers (73.8%) thought that ICT training courses generally focused on developing basic ICT skills rather than pedagogical skills. Similarly, when the respondents were asked to express their views about how they feel about the current ICT training courses, three in five teachers indicated that good quality training was not available to them.

Table 8: Professional development and training in the use of ICT (n=42)

	Items	Agree		Disagree	
		%	n	%	n
33	I have attended ICT training course.	90.5	38	7.1	3
34	I feel that good quality training is available for us.	40.5	17	59.5	25
35	I feel that ICT training isn't appropriate to my teaching in the classroom.	61.9	26	33.3	14
36	ICT training courses focus on developing basic ICT skills rather than pedagogical ICT skills.	73.8	31	23.8	10
37	I fell that I need more training in the use of ICT.	78.6	33	19.0	8
38	I'm interested but training doesn't seem to be available.	45.2	19	42.9	18
39	I have a lack of time to practise and become familiar with ICT.	61.9	26	31.0	13
40	I have not got enough time to attend ICT training courses.	61.9	26	33.3	14

Furthermore, four out of five teachers (78.6%) felt that they needed more training in the use of ICT and 45.2% of them thought that training did not seem to be available although they were interested in. The issue of time was also raised in the questionnaire, which has been found as impeding factor for the successful uptake of ICT by teachers in many studies. Similarly, in our study, the teachers appeared to have a lack of time to become familiar with ICT. Approximately, three in five respondents reported that they did not have enough time to attend ICT training courses.

- **National ICT policy**

Teachers were asked to express their perceptions about the national ICT policy on Turkish primary school system. Considering the teachers' awareness of national ICT policy in education, almost two in three teachers (59.5%) thought that national ICT policy in education was not known by almost all teachers. Furthermore, when asked teachers about the support provided by MONE regarding the ICT integration into schools, majority of them (83.3%) complained about the lack of financial support. Moreover, 61.9% of them felt that there was an inconsistent support from MONE.

Table 9: National ICT policy (n=42)

	Items	Agree		Disagree	
		%	n	%	n
41	National ICT policy is known by almost all teachers.	35.7	15	59.5	25
42	I feel that integration of ICT into school is supported consistently by MONE.	38.1	16	61.9	26
43	There is a lack of financial support from MONE for the integration of ICT in the schools.	83.3	35	16.7	7
44	We need a national initiative to ensure that ICT development is encouraged more consistently.	81.0	34	14.3	6
45	I think we need a strategy for the implementation of ICT which is relevant and particular for our school.	78.6	33	16.7	7

Furthermore, eight out of ten respondents (81%) emphasised the importance of comprehensive national initiative which encourages ICT development in schools more consistently. However, although it seems very difficult for Turkish primary schools to have their own ICT policy due to the highly centralised national education system, 78.6% of teachers believed the necessity of developing a strategy for the implementation of ICT which was relevant and particular for their school.

4.2. Interview

In this section, data will be presented from the interviews with four primary school teachers who agreed to take part in the interview after completing the questionnaire among 42 of them. By means of conducting interviews, I aimed to learn more about the factors that affect the teachers in the use of ICT, including personal factors, their relationship with school management, school culture, and MONE concerning the use of ICT in education. Interviewees' comments shall be analysed for each questions together in order to find out

common points or differences among teachers' opinions. In order to appreciate more accurately the opinions of each teachers, their profiles and details are shown in Table 10.

Table 10: The profile of the interviewees

Teachers	Teaching and ICT experience in primary schools	Education and training
T1 (S2)	The first teacher, I interviewed, was a veteran teacher with 28 years of teaching experience. Although he used ICT for himself, he noted that he had never used ICT in his teaching and learning.	He graduated from Faculty of Education and participated in only one ICT in-service training programme.
T2 (S3)	The second interviewee was a young teacher with five years teaching experience. She had been using ICT for a year in her teaching and learning.	She was currently doing MA in education. Furthermore, she attended an in-service ICT training course in this academic year.
T3 (S4)	The third teacher, interviewed, was known as 'ICT champion' in his school. He was quite experienced teacher with 11 years of teaching experience. He had been using ICT in his teaching for more than six years.	He graduated from Faculty of Education and attended several ICT in-service training courses.
T4 (S1)	The last interviewee had more than 8 years teaching experience. She had been using ICT in her teaching for less than 2 years.	She graduated from Faculty of Education and attended several ICT in-service training courses in her career.

- ***What do you think about the role of ICT in teaching and learning?***

The aim of this question was to seek teachers' personal point of view on the use of ICT in teaching and learning, and ascertain whether their beliefs and attitudes about the use of ICT constitute significant barrier for the ICT integration or not. According to results from the interviews, all of the teachers recognized the importance of ICT for the information society. However, while T2 [6-7], T3 [18] and T4 [6-7] appreciate the importance of using ICT in education, T1 expressed a negative feeling about the role of computers in education, but appreciated the benefits of using ICT for different purposes.

> *'...computers have not got any significant value for teaching and learning. I think it is a good tool just for teachers' preparation and school administration.'* [T1: 11-13].

On the other hand, T2 [18-19] expressed positive views during the interview. She described the use of ICT in the classroom as an opportunity for students that encourage them to express their opinions more easily and as a result to become more open-minded person.

Furthermore, T3 and T4 had also very positive opinions about the role of ICT in teaching and learning. T3 [16-17] assumed that teachers would start to use ICT in their teaching instead of textbooks in the near future, and T4 [8-9] believed that it was a good tool that would keep teachers and students enthusiastic about teaching and learning. As a result, it can be concluded that teachers' beliefs and attitudes towards to the use of ICT in education were generally positive apart from T1's.

- ***What benefits does ICT have both teaching and learning?***

This question was asked to all interviewees in order to identify their perceptions on the benefits of ICT, and how these benefits associate with their use of ICT in their teaching and learning. According to T1 [11-12], ICT had no benefits for his teaching and learning, as he thought that it made students lazy and lessons less effective. Although he had never used ICT in his classroom, he mentioned about the effects of ICT on students' homework:

> '*...when I give homework to students, many of them just 'google' it and bring a couple of papers that they have never read. I believe using ICT has not got any benefits for doing homework.'* [T1: 42-45].

This situation might be ascribed to the homework which is incompatible with the use of ICT by students. However, the solution could be giving more relevant homework that enables students to use ICT effectively and creatively. Also, it can be argued that this problem is associated with T1's beliefs about how he recognizes the ICT in teaching and learning, as he holds traditional beliefs and attitudes regarding teaching and learning.

However, T2 [10-12] made a comparison between old educational materials and ICT resources, stressing the importance of time gained from the use of ICT. According to her, the biggest difference of ICT resources from old materials was its accessibility and usability features. She explained that:

> *'I think it makes me fast, and enables me to use a variety of materials from different sources such as from YouTube.'* [T2: 12-13].

Also from the interview comments, T3 [8-9] was very positive on the role of ICT about managing his time. He explained how using ICT with the new curriculum was crucial for managing the time spent in the classroom. He believed that when teachers did not use ICT in their teaching, it was easy to lag behind the curriculum. Furthermore, although T3

accepted that ICT seems very time consuming and difficult to use in teaching and learning process for many teachers, he noted that:

> '*...students can learn very quickly with ICT in comparison with traditional methods... so I don't need to repeat the same subject several times.'* [T3: 10-11].

Nevertheless, in talking about interviewees' opinions about how students are influential in the integration of ICT, T2 and T4 stressed the importance of students as being an important factor that influence the use of ICT in the classroom. T4 [50-52] saw students' low level of ICT literacy and having no access to personal computer at home as a problem that hinders the use of ICT in her lessons. She thought, this situation creates inequality among students. Similarly, T2 noted that:

> '*I share some of the materials with my students online, but the disadvantage is that some of them haven't got computer at home. So, activities like this are very rare.'* [T2: 19-21].

From the responses to interviews, all teachers appeared to consider ICT as an important tool in teaching and learning process apart from T1. However, readiness of students to learn through using technology, their ICT literacy levels and access to computers at home were found as influential factors on the use of ICT in the classroom.

- ***Do you think that school administration supports teachers for the use of ICT?, What kind of supports do they provide?***

By means of this question, it was intended to allow teachers to express their thoughts and explain their relations with their school administration. All teachers replied that their school administration had a supportive attitude towards to the use of ICT by them [T1:19-20; T2:26-27; T3: 28-36; T4; 32-33]. However, T1 did not make any comments on the support provided by school administration, as he did not use ICT in the classroom. On the other hand, T2 [26-27] said that their school administration was very helpful, especially in supporting teachers to join in-service training courses about the use of ICT. Furthermore, she added that her school administration announced everything concerning the ICT for teachers. T3 [28-29] described the attitudes of school administration as very well-intentioned in any issue related the use of ICT in his schools. Moreover, he mentioned about the technical support provided by the school administration:

'...when I have a technical problem during the lessons, they support me and try to find a solution with me.' [T3: 32-33].

- ***How do you describe the school environment for the use of ICT? , How does it affect your teaching with ICT?***

The main purpose of this question was to explore the effects of the school culture and ethos on the use of ICT by teachers. Apart from T1, all teachers replied that they have a positive atmosphere across the school that encourages the use of ICT [T2: 36; T3: 53-55; T4: 43]. However, T1 [34-35] complained about the lack of support from his colleagues. Although he wanted to learn more about ICT from other teachers, he thought that teachers had not got any time that they can spent for each other. On the other hand, T3 [54-55] felt high level of collaboration among teachers about ICT. Moreover, T3's [70-71] interview comments also revealed that along with the implementation of new primary curriculum, teachers had better relationship with their colleagues concerning the use of ICT. He believed that new curriculum provides better chances to discuss and share her experiences with other teachers in the use of ICT.

- ***Do you think that there is high quality of ICT resources that you have access all time and appropriate organisation in your school? , How does this affect your ICT use in your teaching and learning?***

The aim of this question was to seek teachers' opinions on the ICT resources that are available to them for their use, and to investigate whether issues related to ICT resources affect the integration of ICT by teachers. According to the interview comments made by teachers, lack of access to and lack of ICT resources were the most frequently mentioned barriers to the ICT integration. Again T1 preferred not to answer this question, as he did not use ICT resources in his teaching and learning. However, T2 described the lack of educational software in Turkish as an important barrier for the use of ICT in teaching and learning practices. She said that:

'I wanted to show pupils some information about the earthquakes through using ICT in social science lesson... Although there was much software about this subject on internet, I couldn't find any software in Turkish to use.' [T2: 53-57].

Furthermore, she described the lack of suitable software which is compatible with the curriculum as a big barrier for the use of ICT. Although she tried to find some resources for her lessons through internet, due to inappropriateness of resources to the students' level, she thought that internet was not a solution for this problem every time. According to her:

> *' the software that I use must have some values in terms of education.'* [T2: 57].

The classroom used as an ICT lab was also another discouraging factor, as T4 complained about the small size of ICT labs and high number of students. She described this situation:

> *'I spend nearly half of the lesson trying to organize available ICT resources for students and control their behaviour. I think, this has a substantial negative influence on me and my students'* [T4: 39-41].

Moreover, besides impeding teachers to use ICT in their lessons, this situation also creates another problem which is directly linked with the classroom management issues that hinders teachers to keep their students under control.

- ***Have you ever received any support about ICT from your ICT coordinator? , What do you think about this support?***

The main purpose of these questions was to seek teachers' views about the support provided by ICT coordinator. From the interview comments, lack of technical and pedagogical support from ICT coordinator was seen as an important barrier for the use of ICT in teaching and learning. Furthermore, some teachers complained about the lack of onsite technical support in their schools [T2, T4]. They ascribed this situation to the status of ICT coordinator in their school. T2, for example, explained the reason why she felt the lack of onsite technical support in her teaching:

> *'...our ICT coordinator works at the school just for three days'* [T2: 29-31].

Similarly, T4 [28-30] mentioned that it was difficult for the ICT coordinator to provide technical support any time, since he works part-time. However, she emphasized the need to have a person who works full time and supports teachers in the use of ICT. She remarked that:

'Sometimes, I cannot carry on my lesson, because of the lack of technical support. For instance, I wanted to adjust the brightness of the projector, and then it stopped working. So I couldn't continue my lesson with ICT.' [T4: 26-28].

In addition to these findings, T3 [49-51] thought that ICT coordinator's knowledge and skills were adequate in the present context. According to him, when teachers' expectations about using ICT in their lessons increased, he did not suppose that his ICT coordinator would be able to provide enough support that could satisfy teachers.

- ***Have you ever attended any ICT training course? , How did you find it?***

In reviewing the comments of teachers on their professional development and ICT training, all of them expressed negative feelings about the in-service training programmes that they attended. T1 described ICT training courses as unsatisfactory and complained about the crowded classes, lack of ICT resources, and the diversity of participants' ICT knowledge and skills as well as their expectations from ICT:

'...the class was very crowded, and 3 or 4 persons were using the same computer. Moreover, the participants' experiences with and expectations from ICT varied considerably. Thus, I could not utilize it very much.' [T1; 49-51].

Furthermore, T2 [50-51] stated that the ICT training courses, provided by MONE, have always the same content. She highlighted the importance of providing ICT training programmes which could enable teachers to develop and update their knowledge and skills in ICT. The responses to interview questions also highlight the reasons of inadequate time that teachers had for ICT training courses. T3 [59-61] stated that it is not easy for him to find any time for devoting the use of ICT apart from school time, because of heavy workload and low wages. On the other hand, T4 [45-47] suggested that the workshops provided by ICT coordinator could be separated and done in a more convenient time, as she thought that workshops that took place after school time was not very effective. As it can be seen, teachers' time that they can devote for ICT was also seen an important factor which impedes them to integrate ICT in their teaching and learning.

- ***What do you think about the attitudes of MONE towards the use of ICT in primary schools and national ICT policies in education?***

This question was asked to all interviewees in an attempt to reveal their opinions about the attitudes of MONE towards the integration of ICT into primary schools and its ICT policies. All of the teachers agreed that current ICT policies made by MONE were ineffective for the ICT integration. According to T2, the only way that teachers could integrate ICT into teaching practices was to have enough ICT resources, especially educational software for each subject relevant to the new primary curriculum. She saw MONE in the first place that could provide those ICT resources, and went on:

> *'...unfortunately primary schools in our country have never received such support from MONE.'* [T2: 61-62].

In addition to this, T3 [83-85] made similar comments. He complained about the lack of having enough financial support from government. He believed that this situation was an important barrier for the implementation of ICT in primary school. Furthermore, T3 [86-87] emphasized the importance of donations from parents and private voluntary organizations. He mentioned that like so many schools, his schools do rely on the donations from parents and private voluntary organizations to supplement Government funding.

On the other hand, T4 pointed out another aspect of ICT policies on the integration of ICT into primary schools. She described the structure of Turkish education system as a problematic, and mentioned the disadvantages of using top-down policy approach that:

> *'...policy-makers often try to impose their policy using top-down approach. However, they always ignore the differences among schools and the regions of the country in terms of socio-economic situation and cultural diversity...'* [T4: 54-57].

According to her, in order to integrate ICT into all schools successfully, every school should have its own ICT policy which would be developed through taking into account the capability of schools and socio-cultural features of the society they are located [T4: 58-59].

CHAPTER FIVE

5. ANALYSIS & DISCUSSION

The findings reported in the previous chapter provided answers to the two research questions and highlighted the teachers' perceptions of the factors helping or hindering the integration of ICT by them into their teaching and learning. It is clear that there are many factors that influence the uptake of ICT by Turkish primary school teachers. In this chapter, the discussion of these factors will be presented with reference to the levels at which they are classified. Research questions will be answered for each level through analysing the findings presented in the previous chapter, and discussing how these findings associate with the results of the previous studies. As stated earlier, in the literature teacher level factors indicate teachers' beliefs and attitudes, teacher confidence, and teachers' knowledge and skills about the use of ICT. School level factors refer to the school leadership, access and quality of resources, technical and pedagogical support, and school ethos and collaborative culture. And, national level factors point to the national ICT policies, and professional development of teachers and training in the use of ICT in education.

5.1. Teacher level factors

According to the results of this study, high proportion of teachers holds positive beliefs and attitudes about the role of ICT in education. They consider ICT as an important companion in teaching and learning process. Furthermore, many of them believed that ICT helps students to acquire new knowledge effectively. These responses highlight how much significance Turkish primary school teachers place on using ICT in teaching and learning. These findings are important for the ICT integration, as a number of earlier studies have demonstrated that teachers' beliefs and attitudes towards ICT in education have a significant influence on how they integrate ICT and how they motivate themselves to use

ICT in their teaching and learning (Ertmer *et al.,* 1999; Jimoyiannis & Komis, 2007). However, the use of ICT by teachers is generally limited in terms of range and frequency of use in their teaching and learning. Furthermore, half of them also see the lack of confidence in the use of ICT in the classroom as a problem that needs to be tackled for the effective uses of ICT.

Nevertheless, this study identifies a number of factors that influence the teachers' beliefs and attitudes about using ICT in education. For example, readiness of students to learn through using technology, students' low-level of ICT literacy and students' lack of access to computers at home were found as a barrier to the teachers' use of ICT in their teaching. This study also confirms previous studies which have found the 'personal philosophical beliefs of teachers' as a crucial factor in determining whether teachers will use ICT in their teaching and learning or not (Ertmer & Albion, 2002; Becker, 2001). Similarly, in this study teachers who hold traditional beliefs and attitudes regarding teaching and learning do not see any benefits of using ICT in education, but acknowledge the importance of ICT for the information society. Furthermore, the findings of this study demonstrate that many teachers do not have adequate knowledge and skills to use ICT in their teaching efficiently. Although, many of them reported that they can easily use ICT for the personal purposes, majority of them stated that they do not have enough pedagogical skills and knowledge to use ICT in the classroom. Thus, Turkish primary school teachers need not only to be trained and supported in the uses of ICT materials, but they need to be provided enough pedagogical knowledge and skills about how to teach their subject effectively using specific ICT resources to enhance their students' learning.

To sum up, although Turkish primary school teachers' beliefs and attitudes towards the use of ICT in teaching and learning are generally positive, at the teacher level there are still some barriers that impede teachers to use ICT in education, such as inadequate knowledge and skills, and lack of confidence in the use of ICT. These barriers can also influence the teachers' beliefs and attitudes, as Levin and Wadmany (2005) argue that while teachers' knowledge and beliefs play a significant role in influencing and underpinning their classroom practices, at the same time, classroom experience also affects how teachers' knowledge and beliefs about teaching and learning are being formed. Therefore, teachers should be provided with guidance and support in order to facilitate the changes and overcome the barriers mentioned above, since they are the one who plays the central role

in the integration of ICT into teaching and learning. However, it must be noted that "the teacher level barriers are more difficult for policy makers to tackle, as it is the teachers themselves who need to bring about the required changes in their own attitude and approach to ICT, if such barriers are to be brought under control" (Jones, 2004, p.20).

5.2. School level factors

Considering the school level factors, there is clear evidence showing that school leadership provides a supportive and encouraging environment for the use of ICT in the Turkish primary schools involved in this study. Many teachers claim that their school principle has a positive ICT vision which has been found as an encouraging factor for the successful integration of ICT in earlier studies (Pelgrum, 2001; Cohen *et al*., 2004). Turkish primary school teachers also believe that they have a positive school ethos and collaborative culture in their schools that is seen another enabling factor in creating the circumstances for teachers to make successful use of ICT. This is important, as Day and Sachs (2004) argue that "just as conditions in the classroom affect the ability of teachers to provide the best learning opportunities for students, so the school culture provides positive or negative support for its teachers' learning" (*ibid*, p.10). In addition, this study has found new primary curriculum as an encouraging factor for teachers to collaborate more about the use of ICT.

In accordance with other studies regarding the access of ICT resources (e.g., Peralta & Costa, 2007; Cohen *et al*., 2004; Pelgrum, 2001), the limited access to ICT resources due to inappropriate organisation and lack of ICT resources has been found as another barrier to the ICT integration. Furthermore, what is more important among the findings from teachers' responses is that there is a lack of educational software compatible with the primary school curriculum in Turkish language. As mentioned earlier, data obtained from questionnaire showed that there was a low-level use of educational software by primary school teachers for the classroom practices, and considerable diversity in the use of ICT between different primary school lessons. According to interviewees' comments, these results are associated with the lack of appropriate educational software available to teachers to use in their classroom. This study also supports the findings of earlier study (Jones, 2003) which suggests that "in some countries it was important for the national policies to support the development of educational software coordinated with the

curriculum. This was particular so where languages are used that are not common in the international software market place, such as Tai and Catalan" (p.190). Accordingly, we can easily realize that one of the main barriers for the uptake of ICT by teachers was the lack of ICT hardware and unsuitable educational software for the Turkish primary school curriculum, along with the inappropriate organisation of these resources in the ICT labs.

In addition, this study found the lack of technical and pedagogical support as another barrier for the Turkish primary school teachers using ICT in teaching and learning. According to our findings, teachers see a need to be supported pedagogically in order to utilize ICT in their teaching effectively. This is important point, as earlier studies have pointed out the importance of pedagogical support in the implementation of innovative pedagogical practices (Peralta & Costa, 2007). Tearle (2004) suggests that besides knowing how to use ICT materials, school staffs need to understand "the pedagogy required to use them to meet teaching and learning needs" (p.336). Thus, it is important to provide teachers with enough pedagogical support to enable successful innovative ICT practices. However, many teachers believe that their ICT coordinator does not have enough pedagogical knowledge and skills to help them to use ICT in their teaching and learning.

Consequently, although school leadership and school ethos and culture seem to be supportive, there are many barriers that need to be overcome for the successful integration of ICT by teachers at the school level, such as inadequate ICT resources, lack of access to ICT resources and lack of technical and pedagogical support.

5.3. National level factors

Analysis of the findings of this study shows that teachers are generally dissatisfied with the current ICT teacher training programmes. According to Cohen *et al.* (2004), relevance of ICT training that matches teachers' needs and the accessibility of ICT resources to the teachers during the training play a key role in determining the success of ICT training programmes. However, in this study teachers indicate that the ICT training courses, provided by MONE, have always the same content and not being updated according to schools and teachers' needs. This appears to highlight the need of providing ICT training programmes which enable teachers to develop and update their knowledge and skills in ICT. Moreover, teachers indicate that they have a lack of time to attend training programmes in the use of ICT. Furthermore, although it is important for ICT training

programmes to take into account teachers' pedagogy for the successful ICT integration, according to majority of Turkish primary school teachers, current ICT training programmes focus on developing basic ICT skills rather than pedagogical skills regarding the ICT. This is a crucial point, as Cox and Marshall (2007) suggest that the aim of ICT training programmes should not be only to train and support teachers in the uses of ICT materials, but "to challenge teachers' fundamental beliefs about how to teach their subject and how specific ICT resources can enhance and fundamentally change the way in which their students learn" (p.68). Consequently, considering these results, it is highly possible to argue that the quality and quantity of teacher training programmes is not appropriate for the successful integration of ICT by the primary school teachers in Turkey.

Nevertheless, perhaps the most important factor among others is the national ICT policies which can influence the whole process of the ICT integration into Turkish primary school system. It is well known that making policies to produce successful educational outcomes is a serious challenge that policy makers face, since it requires careful planning and decision making, adequate financial support, encouragement and commitment to the implementation process. However, according to many teachers, national ICT policies in Turkey are ineffective due to lack of financial support, lack of commitment and the structure of education system which is highly centralized. Literature suggests that local policies are more effective than national policies in supporting and encouraging the implementation of innovative pedagogical practices in the use of ICT (Younie, 2006; Cohen *et al.*, 2004). Similarly, in this study majority of teachers see a need for an ICT implementation strategy which is relevant and particular for their schools, and developed through taking into account the capability of schools and socio-cultural features of the society they live in.

CHAPTER SIX

6.1. Conclusion

It is obvious that with the introduction of ICT initiatives, Turkish primary school teachers are expected to integrate ICT into their teaching and learning, in order to provide students with the necessary skills and knowledge needed for the future information society and knowledge-based economy. However, this is not an easy task to achieve, since there are lots of factors operating at different levels and influencing the change process. Therefore, this study focused on examining the teachers' perceptions of the factors that help or hinder the integration of ICT into primary schools in Turkey.

The first research question of this study sought to identify the factors that help teachers to integrate ICT into teaching and learning. The results show that many teachers had positive beliefs and attitudes towards the use of ICT in education. They acknowledged the benefits of using ICT in teaching and learning. Moreover, the attitudes of school leadership and the school culture and ethos have been identified as enabling factors for the successful ICT integration into Turkish primary schools. Many teachers saw their school leadership as supporter for the ICT integration. They also claimed that their school had a positive culture and ethos that encourages teachers to collaborate more about the use of ICT in teaching and learning.

On the other hand, in relation to the second research question which sought to examine the teachers' perceptions of the factors which hinder the integration of ICT by teachers in their teaching and learning, this study identified many barriers, such as lack of teacher confidence, lack of ICT skills and knowledge, lack of technical and pedagogical support, inadequate ICT resources, inappropriate ICT training programmes and ineffective national ICT policies. In asking what the findings of this study mean for the integration of ICT into Turkish primary school system, we should seek connections between the factors identified

in this study. It is easily seen that all of the factors are interrelated and need to act in harmony in order to have a successful integration of ICT. For example, inappropriate ICT training programmes can be seen as sources of other factors affecting the ICT integration, such as lack of teacher confidence, and lack of skills and knowledge in the use of ICT. Furthermore, national ICT policy can be seen as a factor that influences the whole integration process either facilitating or creating the barriers to the integration of ICT into schools. For instance, if there is inadequate financial support or no commitment from government to the ICT policies, it is not easy for teachers to integrate ICT into teaching and learning, since their schools cannot purchase necessary ICT resources or provide them with the support for their teaching and learning in the use of ICT.

Consequently, it seems quite clear that there are many factors either helping or hindering the integration of ICT by teachers into their teaching and leraning. However, it must be noted that it not solely enough for teachers to have positive attitudes and beliefs about ICT or supportive school leadership and environment for the successful integration of ICT into teaching and learning, as the success of the integration of ICT heavily depends on how all of the factors at the macro, meso and micro level fit together to impact on teaching and learning with ICT.

6.2. Implications for teaching and learning

So what are the implications of this study for teaching and learning? What forms of ICT training programme or new implementation strategies might be practical in the current context? In answering these questions, this study suggests that in order to enable teachers to make successful use of ICT in teaching and learning, factors influencing the integration of ICT should be scrutinized carefully by all stakeholders and new implementation strategies and new forms of ICT training programmes should be developed taking into account the current situation in Turkey.

First of all, it must be noted that attempts made at the school level to tackle the barriers to the ICT integration are unlikely to become successful due to limited power that school leaderships have because of the structure of the education system. Thus, the way that teachers can successfully integrate ICT into their teaching and learning might be possible, if the schools have the opportunity to plan and develop their ICT implementation strategies according to their needs and requirements. Therefore, the national ICT policies and strategies need to be modified according to local needs and requirements of each schools

and teachers who might have different conditions. Furthermore, school must be provided with enough guidance and support by MONE, such as adequate financial support, enough ICT resources, access to ICT policy documents, a complete guide to develop a school plan and the experts in the field of ICT in education.

In addition, it appears quite clear that teachers should be provided with new forms of ICT training that matches teachers' needs and focuses on teaching and learning practices rather than how to use ICT materials. Furthermore, flexible training is needed that provides choices and opportunities for teachers who are in different situations.

6.3. Limitations of the study

It is worth to mention about the some limitations of this study that should be dealt with in the future research. First of all, due to time limitations, this research was limited to a small sample of teachers from four primary schools in the Anatolian side of Istanbul in Turkey. Therefore, future research in this area requires a larger and longitudinal study which takes into account the opinions of larger number of teachers together with school principals, ICT coordinators and district officers. Secondly, in this study only interviews and questionnaires were chosen to collect data from primary school teachers. In the future research, a more comprehensive methodological approach should be used in order to grasp the different aspects of the factors influencing the integration of ICT into Turkish primary schools.

6.4. Further research

Finally, findings of this study raise additional questions that deserve to be investigated in further research, such as what is the intensity level of each factors affecting the integration of ICT into primary schools?, what will be the long-term impact on the use of ICT in teaching and learning? and what is a learning outcome in the context of ICT, given that the curriculum is designed for 'paper and pencil' teachnology?

Appendix - A

Questionnaire

1- How old are you? .....

2- Your gender? .....

3- How many years of teaching experience do you have?

i. less than 1 year ( )
ii. 1-5 years ( )
iii. 6-10 years ( )
iv. 10 + ( )

4- Do you use ICT in your teaching and learning? .....

5- How many years do you use ICT in your teaching and learning?

i. less than 1 year ( )
ii. 1-5 years ( )
iii. 6-10 years ( )
iv. 10 + ( )

6- Do you use the following ICT resources in each of the contexts - classroom practice, personal use?

Type of ICT resources	Only personal use	Only classroom practice	Both for classroom practice and personal use	Neither for classroom practice or personal use
Internet and World Wide Web (WWW)				
E-mail				
Word-processing				
Databases				
Educational software packages (externally produced)				
Educational software packages (internally produced)				
CD-ROM information sources e.g. Encarta				
On-line information sources e.g. (Curriculum online)				
Spreadsheets				
Other (please state)				

7- How often do you use ICT in the following lessons?

Please code as follows: **W = Weekly M = Monthly N = Never**

Lessons	**W**	**M**	**N**
Foreign Language:			
Art:			
Science:			
Mathematics:			
Social Sciences:			
Turkish Language:			
Other (please state)			

8- Where do you have access to ICT resources? (please tick all that apply)

Classroom	
Computer lab	
Library	
Home	
Other (please state)	

9- What do you think about ICT?

(Please indicate whether or not you agree with each of the statements below by ticking the most appropriate box, or if you are neutral, please leave it empty.)

		Agree	Disagree
1	I am enthusiastic about using computers.		
2	I feel quite confident when I use ICT in my teaching		
3	I find it easy to select appropriate ICT resources for my teaching.		
4	I think computers are an important part of teaching.		
5	I cannot see any benefits of computers.		
6	I really want to know more about developing my skills in ICT.		
7	I need to develop my skills and knowledge for the pupils' benefit.		
8	I am only interested in developing my skills and knowledge for personal purposes.		
9	I find using ICT time consuming.		
10	ICT helps me to cut down my preparation time.		
11	I feel ICT helps pupils acquire new knowledge effectively.		

12	I use ICT effectively myself but I'm not sure how to teach the pupils with ICT.		
13	I use ICT effectively both in my teaching and for myself.		
14	I know the basics of ICT but that is all.		
15	I don't have the appropriate skills to use it effectively in my teaching.		
16	I feel my skills and knowledge in ICT are adequate.		
17	I do not have enough pedagogical knowledge in the use of ICT.		
		Agree	Disagree
18	Our school principal has a positive ICT vision.		
19	Our school administration supports us for our PD in the use of ICT.		
20	I have enough support from my school principal.		
21	I think we need a strategy for the implementation of ICT which is relevant and particular for our school.		
22	I have full access to ICT resources at all times in my school.		
23	High quality resources available in my school.		
24	There are poor quality of resources and inappropriate organisation of ICT resources in my school.		
25	There is a lack of ICT resources in my school.		
26	Effective timetabling of rooms and equipments are available at all times.		
27	Current school curriculum is relevant to use of ICT in teaching and learning.		
28	My current school has a positive attitude to ICT use.		
29	My current school provides opportunities to work and share with other teachers.		
30	I do not have enough technical support in the use of ICT.		
31	I need a pedagogical support to use ICT in my teaching.		
32	Our ICT coordinator does not have enough pedagogical knowledge to help me use ICT in my teaching.		
33	I have an onsite technical support from ICT coordinator in the use of ICT.		
34	I have a lack of time to practise and become familiar with ICT.		
35	I feel that integration of ICT into school is supported consistently by MONE.		
36	We need a national initiative to ensure that ICT development is encouraged more consistently.		
37	National ICT policy is known by almost all teachers.		
38	There is a lack of financial support for the integration of ICT in the schools.		
39	I feel that good quality training is available for us.		
40	I have attended ICT training course.		
41	I feel that ICT training isn't appropriate to my teaching in the classroom.		
42	I'm interested but training doesn't seem to be available.		
43	I fell that I need more training in the use of ICT.		
44	ICT training courses focus on developing basic ICT skills rather than pedagogical ICT skills.		
45	I have not enough time to attend ICT training courses.		

Please indicate if you have any comment about ICT.

.....

.....

.....

..... **Important note**: If you wish to take part in the interview, please contact me via this email (ucanserkan@yahoo.com)

Anket Soruları (Turkish)

1- Yaşınız? .....

2- Cinsiyetiniz? .....

3- Kaç yıldır öğretmenlik yapmaktasınız?
   i. 1 yıldan az ( )
   ii. 1-5 yıl arası ( )
   iii. 6-10 yıl arası ( )
   iv. 10 + ( )

4- Derslerinizde bilgisayar teknolojilerinden faydalaniyormusunuz?
   a. Evet
   b. Hayır

5- Kaç yıldır eğitim ve öğretim için bilgisayar teknolojilerinden yararlanmaktasınız?
   i. 1 yıldan az ( )
   ii. 1-5 yil arası ( )
   iii. 6-10 yil arası ( )
   iv. 10 + ( )

6- Aşağıdaki kaynaklardan hangilerini hangi amacla kullanmaktasınız?
(G= günlük, H= haftalık, A= aylık, K= kullanmıyorum)

Bilgisayar teknolojileri kaynakları	**Kisisel**	**Egitimsel amacla**	**Hem kisisel, hemde egitim amacli**	**Kullanmi-yorum**
Internet and World Wide Web (WWW)				
E-mail				
Microsoft word				
Bilgisayar (Bilgi depolama amaçlı)				
Eğitim yazılımları (kendi ürettiğiniz)				
Eğitim yazılımları (Başkaları tarafından üretilen)				
CD-ROM				
On-line bilgi kaynakları (örnek: internet TV)				
Microsoft Excel				

7- Hangi derslerde bilgisayar teknolojilerinden yararlanırsınız?
(H= haftalık, A= aylık, K= kullanmıyorum)

Dersler	**H**	**A**	**K**
Yabancı dil Dersi			
Resim-İş Dersi			
Fen bilgisi			
Müzik			
Matematik			
Sosyal bilimler			
Türkçe			
Diğer (lütfen belirtiniz) =			

8- Bilgisayar teknolojileri kaynaklarına nerelerde erişim imkanınız bulunmaktadır?

Sınıfta	
Bilgisayar lab.	
Öğretmenler odasında	
Kütüphanede	
Evde	
Diğer (lütfen belirtiniz)	

9- Bilgisayar teknolojileri hakkındaki düşünceleriniz nelerdir?
(Lütfen ayni düşünceye katılıp katılmadığınızı kutuları işaretleyerek belirtiniz (X), uygun görmediğiniz soruyu boş geçiniz)

		Katılıyorum	Katılmıyorum
1	Bilgisayar teknolojilerini kullanmaya hevesliyimdir.		
2	Derslerimde bilgisayar teknolojilerinden yararlandigim zaman genelde kendimi rahat hissederim.		
3	Derslerim için uygun bilgisayar teknolojileri kaynaklarını seçmek benim için çok kolaydır.		
4	Bilgisayarları eğitim ve öğretimin önemli bir parçası olarak görürüm.		
5	Bilgisayarların eğitim ve öğretim icin her hangi bir faydası olduğuna inanmıyorum.		
6	Bilgisayar teknolojilerinde bilgi ve becerilerimi geliştirmek için daha çok şey öğrenmek isterim.		
7	Bilgisayar teknolojilerinde bilgi ve becerilerimi gelişmesini öğrencilerimin yararı için istiyorum.		
8	Bilgisayar teknolojilerinde bilgi ve becerilerimi gelişmesini kisisel kullanımım için istemekteyim.		
9	Derslerimde bilgisayar teknolojilerini kullanmayı zaman kaybı olarak görüyorum.		
10	Bilgisayar teknolojilerini derslere hazırlıkta kullanmak bana zaman kazandırır.		
11	Bilgisayar teknolojilerinin öğrencilere yeni bilgi ve beceriler kazandırdığına inanıyorum.		

12	Bilgisayar teknolojilerini kendim için çok verimli kullanırım, ama eğitim ve öğretimde nasıl kullanılacağı konusunda pek bir fikrim yok.		
13	Hem kendim için, hemde derslerimde eğitim ve öğretim için bilgisayar teknolojilerini çok etkili şekilde kullanırım.		
14	Sadece temel bilgisayar bilgi ve becerisine sahibim.		
15	Bilgisayar teknolojilerini derslerimde etkili bicimde kullanmak için yeterli bilgi ve beceriye sahip değilim.		
16	Bilgisayar teknolojilerinde bilgi ve becerilerimin yeterli olduğuna inanıyorum.		
17	Bilgisayar teknolojilerini derslerimde kullanmada eğitimsel (pedagogical) bilgi ve beceriye sahip değilim.		

		Katılıyorum	Katılmıyorum
18	Okul müdürümüzün bilgisayar teknolojilerini derslerimizde kullanmamiz hakkında olumlu bir vizyonu bulunmaktadır.		
19	Okul yonetimi bilgisayar teknoljilerinde mesleki gelisimimiz konusunda gerekli destegi saglamaktadirlar.		
20	Okul müdürümüzden bilgisayar teknolojilerinin kullanımı konusunda yeterli desteğe sahip bulunmaktayım.		
21	Okulumuzun bilgisayar teknolojileri politikasının bütün öğretmenler tarafından bilindiğini düşünmekteyim.		
22	Okulumuzda bilgisayar teknolojileri kaynaklarına her zaman erişim imkânım bulunmaktadır.		
23	Okulumuzda yüksek kalitede bilgisayar teknolojileri kaynakları bulunmaktadır.		
24	Okulumuzda düşük kaliteli ve organizasyonu düzensiz yapılmış bilgisayar teknolojileri kaynakları bulunmaktadır.		
25	Okulumuzun bilgisayar teknolojileri kaynakları yetersizdir.		
26	Bilgisayar teknolojileri kaynaklarını ve bilgisayar laboratuarlarını kullanmada etkili bir zaman çizelgesine sahip bulunmaktayız.		
27	Kullanmış olduğumuz müfredat bilgisayar teknolojileri kullanmamız için uygundur (öğrenci merkezli).		
28	Okulumuz bilgisayar teknolojilerinin kullanımına yönelik olumlu bir tutuma sahiptir.		
29	Okulumuzda diğer öğretmenlerle birlikte calisabileceğim ve bilgi alışverişi yapabileceğim uygun bir ortam mevcuttur.		
30	Bilgisayar teknolojilerini kullanma konusunda okulumuzda yeterli teknik desteğe sahip değilim.		
31	Bilgisayar teknolojilerini derslerimde kullanmam için eğitimsel (pedagogical) acıdan destek alamamaktayim.		
32	Okul bilgisayar ogretmenimiz (egitmenimiz) bilgisayar teknolojilerini derslerimde kullanmama yârdim olabilecek kadar yeterli eğitimsel (pedagogical) bilgi ve beceriye sahip degildir.		
33	Bilgisayar teknolojileri hakkında pratik yapıp becerilerimi geliştireceğim zamanim çok kısıtlı		
34	Bilgisayar teknolojilerini kullanmak konusunda ilgiliyim fakat zamanım çok kısıtlı.		
35	Bilgisayar teknolojilerini egitimde kullanilmasini temin edecek ulusal egitim politikalarına ihtiyacımız vardır.		
36	MEB'in bilgisayar teknolojileri politikalarinin hemen hemen bütün öğretmenler tarafından bilindiğini dusunmekteyim.		
37	Bilgisayar teknolojilerinin okullara entegrasyonu için yetersiz finansal kaynak olduğunu düşünüyorum.		
38	Bilgisayar teknolojileri hakkında mesleki gelişimim için uygun hizmet içi (bilgisayar kursları) kurslar mevcuttur.		
39	Bilgisayar teknolojilerinin etkili kullanımı için yeterli derecede eğitim veren		

	hizmet içi kurslar olduğunu düşünmüyorum.		
40	Daha önce bilgisayar teknolojileri ile ilgili kurslara (bilgisayar kursu) katildim.		
41	Almis olduğum kursların bilgisayar teknolojilerini derslerimde kullanmam için uygun olduğunu düşünmüyorum.		
42	Bilgisayar teknolojileri ile ilgili kurslara katılmaya istekliyim fakat hazır bulunan herhangi bir kurs mevcut değildir.		
43	Bilgisayar teknolojileri konusunda daha çok eğitim almaya ihtiyacım bulunmaktadır.		
44	Genelde bilgisayar teknolojileri ile ilgili kurslar bilgisayar teknolojilerini derslerimde nasıl kullanmam ile ilgili bilgi ve beceri kazandırmaktan ziyade temel bilgisayar becerilerini geliştirmeye yönelik kurslardır.		
45	Bilgisayar teknolojileri ile ilgili kurslara katılmak için yeterli zamanım bulunmamaktadır.		

Bilgisayar teknolojileri ile ilgili başka bir yorumuz var ise lütfen belirtiniz.

.....

.....

.....

..... **Önenli not**: Yapılacak olan mülakata katılmak isterseniz lütfen email yolu ile irtibata geçiniz (ucanserkan@yahoo.com)

Appendix – B

Interview – T1

1- **SU:** Hello, how are you?
2- **T1:** Thanks, I am good, what about you?
3- **SU:** I am fine, ok, I am asking my first question, do you use ICT in your teaching and
4- learning?
5- **T1:** No I don't use in my teaching; I use ICT only for personal purposes.
6- **SU:** Can I learn the reason that you don't use ICT in the classroom?
7- **T1:** As you know technology is increasingly developing... or maybe I am an old teacher.
8- **SU:** Umm, how many years teaching experience do you have?
9- **T1:** Almost 28 years...
10- **SU:** Ok, what do you think about the role of ICT in teaching and learning?
11- **T1:** I think, it is exciting and very important for anyone, but computers have not got any
12- significant value for teaching and learning. I think it is a good tool just for teachers'
13- preparation and school administration.
14- **SU:** Ok, sir, do you have enough skills and knowledge in the use of ICT?
15- **T1:** unfortunately, very limited, but I like to improve... we need to keep pace with the
16- technology.
17- **SU:** Thank you, I am asking the next question, umm, do you think that school administration
18- supports teachers for the use of ICT?
19- **T1:** As far as I am concerned, school administration is very helpful for everything, but I
20- cannot make any comment about ICT, I guess they are supportive for this as well.
21- **SU:** All right, do you think that there are enough resources and appropriate organisation in
22- your school?
23- **T1:** I have never thought that the ICT resources, in my school, are sufficient. For example,
24- the ratio of computers to students and teachers is quite low.
25- **SU:** Do you think that existing ICT resources are being used efficiently?
26- **T1:** I think since there are not enough resources, teachers cannot exploit them with the all
27- students. So they are not well organized and lessons are less effective.
28- **SU:** Um... what do you think about the ICT coordinator?
29- **T1:** I think ICT coordinator works for just few days in the school. Actually, I have got no idea
30- about him...
31- **SU:** How do you describe the school environment for the use of ICT? For example, how is
32- your relation with your colleagues?
33- **T1:** Actually, I am working in a good environment. My colleagues always try to help me
34- about ICT. However, I cannot ask whatever I want all the time, since I think many of them
35- don't have enough time for collaboration.
36- **SU:** Ok, sir, for example, you want to develop your skills and knowledge in the use of ICT,
37- you want to attend in-service training courses. Do you think that you can find adequate time?

38- **T1:** No, I do not think so
39- **SU:** Why?
40- **T1:** I teach all day, and it is very difficult to devote any time for this.
41- **SU:** Another question, what do you think about students and ICT in education?
42- **T1:** Umm... ok, for example, when I give homework to students, majority of them just
43- 'google' it and bring a couple of papers that they have never read. I believe using ICT has not
44- got any benefits for doing homework. It makes students lazy, and effectiveness of lessons
45- low.
46- **SU:** Ok, have you ever attended any ICT training course?
47- **T1:** Yes I have attended...
48- **SU:** How did you find it?
49- **T1:** The in-service training programme that I attended was not very satisfactory. The class
50- was very crowded, and 3 or 4 persons were using the same computer. Moreover, the
51- participants' experiences with ICT varied considerably. Thus, I could not utilize it very much.
52- .....
53- **SU:** Sir, thank you very much indeed, I think we looked at all the questions.
54- **T1:** Thank you, I am happy, if I could answer the questions!

Interview – T1 (Turkish)

1- **SU:** Merhabalar hocam nasilsiniz?
2- **T1:** Tesekkurler, size sormali?
3- **SU**: Bende iyim, tesekkur ederim, isterseniz sorulara gecelim. Ilk sorum, BT derslerinizde
4- kullanirmisiniz?
5- **T1:** Bil.tek. derslerimde kullanmiyorum, sadece kisisel amacli olarak kullaniyorum.
6- **SU:** Kullanmama nedeninizi ogrenebilirmiyim.
7- **T1:** Teknoloji hizli gelistigi icin... eski ogretmen oldugumuz icin kullanamiyorum
8- **SU**: Kac yildir ogretmensiniz?
9- **T1**: Yaklasik 28 yildir.
10-**SU**: Peki. bilgisayar teknolojilerinin egitim ve ogrenimde hangi role sahip oldugunu
11- dusunuyorsunuz?
12- **T1:**Benim gorusume gore, ogrenciler icin onemli bir faydasi yok, bence diger isler icin
13-mesela okul idaresi yada derslere hazirlik icin cok yararli.
14- **SU**: Hocam, peki BT ile ilgil yeterli bilgi ve beceriniz varmi?
15- **T1**: Malesef cok az, ama gelistirmek isterim, teknoloji hergun degisiyor, degisime ayak
16- uydurmak lazim.
17- **SU:** Okul yonetimi ile ilgili neler dusunuyorsunuz? Bilgisayar kullanmi konusunda
18- ogretmenlere yardimci oluyorlarmi?
19- **T1**: Okul yonetimi hemen hemen herseye yardimci oluyor, ama BT ile ilgili pek bi yorum
20-yapamayacagim, sanirim yeterli destegi veriyorlar.
21-**SU:** Okulda yeterli BT kaynaklari varmi acaba.
22-**T1:** Kaynaklarin kesinlikle yeterli oldugunu dusunmuyorum. Her ogrencinin her ogretmenin
23-yararlanabilcegi kaynak yok.
24-**SU:** Var olan kaynaklar verimli olarak kullanilabiliniyourmu?
25-**T1:** Zaten kisi basina dusen bil. sayisinin cok az, elde bulunan kaynaklarin organizasyonu ve

26-derslerin verimini dusuren onemli etkelerden birisi tabiki.
27-**SU**: Formator ogretmen hakkinda neler dusunuyorsunuz?
28-**T1**:Haftanin belirli gunlerinde geliyor, pek fazla bir bilgim yok acikcasi...
29-**SU**: Ogretmen arkadaslarinila aranizda destekleyici bir ortam varmi?
30-**T1:** Evet var. Arkadaslarim bilgisayar ile ilgili olan islerde bana yardimici olmaya calsiyorlar.
31-Ama gerektigi gibi yeterli degil tabiki, bir sey sormak istedigimde mesela, zamanlarinin kisitli
32-olmasi nedeniyle pekte bir sey isteyemiyorum.
33-**SU:** Hocam mesela BT ile ilgili kedinizi gelistirmek, kursa katilmak istiyorsunuz, yeterli
34-zamani bulabilirmisiniz?
35-**T1:** Pek bi zamanim yok.
36-**SU:**Neden?
37-**T1:** Malesef sabahtan aksama kadar okulda calsiyoruz, artircak pek bi zamanim yok.
38- **SU:** ogrencilerle ilgili neler dusunuyorusnuz?
39-**T1**: Verdigimiz odevler konusnda mesela, cocuk internetten ciktiyi alip geliyor hic
40-okumadan, bil. tek. verilen odevler konusunda cokta yararli olmadigini dusunuyorum.
41-Ogrencilerin daha cok tembellesmesine ve derslerin verimin dusmesine neden oluyor.
42-**SU:** Daha once bil. kurslarina katildinizmi hocam?
43-**T1:** Katildim...
44-**SU:** Nasil buldunuz hocam?
45-**T1:** Kurslar yetersiz zaman oldurmek icin, kalabalik oluyo 2 -3 kisiye bil. dusuyor. Herkes
46-ayni seviyededegil. Katilimcilarin sahip oldugu bigi duzeyleri cok farkli. Biri cok iyi biliyor,
47-digeri hic bilmiyor.
48- .....
49-**SU:** Hocam tesekkur ederim, sanirim hemen hemen butun sorulari tartistik.
50-**T1:** Cevaplayabildiysem ne mutlu bana...!

Appendix – C

Interview - 2

SU: Hello, thank you very much for coming for the interview...
T2: You are welcome...
SU: Ok, I am asking my first question, do you use ICT in your teaching and learning?
T2: Yes I do, not very often...
SU: Ok, could you explain why do you prefer ICT to use in your teaching?
T2: The reason that makes me use ICT is that I believe children can learn better when they see and listen. They can understand the subject better. It is not enough just to tell the subject.
SU: What is the difference between teaching with ICT and without ICT if you make comparison?
T2: I think here are big differences. For example, before ICT, I used to bring cassette-player to the classroom to play a song in foreign language lesson. The biggest difference of ICT resources from old materials is its accessibility and usability features. I think it makes me fast, and enables me to use a variety of materials from different sources such as from YouTube.
SU: Right...
T2: Also, I can make preparation for the lessons very quickly.
SU: I think you answered my next question; it was about the role of ICT in education. Umm... ok, what do you think about the benefits of ICT for students?
T2: I believe that, through ICT, students become more open-minded. They can express their views more easily. I share some of the materials with my students online, but the disadvantage is that some of them haven't computer at home. So, activities like this are very rare.
SU: Do you think that you have enough ICT skills and knowledge?
T2: No I have never found my skills and knowledge in the use of ICT enough...
.....
SU: What is the school leadership's attitude towards the use of ICT in education?
T2: It is very positive. Sometimes they accompany me in my lessons. They also support us to join ICT training courses. They announce everything concerning ICT.
SU: Ok, what do you think about the support from ICT coordinator?
T2: Our ICT coordinator works at the school just for three days. Although we can call her and try to solve the problem, when she is not available, we feel the lack of hands-on technical support in our lessons.
SU: How is the environment in which you are working? Is it convenient for the use of ICT?
T2: Umm... It is enough positive, I always collaborate with my colleagues.
SU: All right... another question, do you have enough time to devote for practicing and becoming familiar with ICT?
T2: Yes I do.

37- **SU:** I think it is your personal time...
38- **T2:** Yes, the time that I can use is very limited. Generally, we are required to use our own
39- personal time for developing knowledge and skills in the use of ICT.
40- **SU:** Umm... As you know new curriculum was developed two years ago, what would you say
41- about ICT, if you make a comparison between old and new curriculum?
42- **T2:** Of course, the old one was teacher-centred, it was very difficult for students to express
43- themselves. Now, with the help of ICT, students are more motivated in the lessons. Also new
44- curriculum plans include many activities that encourages the use of ICT in the classroom.
45- **SU:** Thank you, the next question... have you ever attended any ICT training course?
46- **T2:** Yes...
47- **SU:** How was it?
48- **T2:** I learned basic ICT skills, they showed us how to use ICT resources. It was three weeks
49- training, 8 years ago in Ankara. I was taught how to use Excel and Word. And I received
50- second training was this year. Actually, it was similar. I think, the ICT training courses,
51- provided by MONE, have always the same content.
52- **SU:** So, **y**ou did not learn anything about how to teach using ICT?
53- **T2:** Unfortunately, no. It is an important drawback for me. Another thing is that the lack of
54- software in Turkish language is really problem for us. For example, I wanted to show pupils
55- some information about the earthquakes through using ICT in social science lesson...
56- Although there was much software about this subject on internet, I couldn't find any software
57- in Turkish to use. Also the software I use must have some values in terms of education.
58- **SU**: Ok...
59- **T2:** Especially, I want MONE to provide schools with enough ICT resources, especially
60- educational software for each subject relevant to the new primary curriculum. It is the only
61- way that we can incorporate ICT into curriculum. ...unfortunately primary schools in our
62- country have never received such support from MONE.
63- **SU:** Thank you very much, I appreciate that you have spent your time for my research...
64- **T2**: You are welcome!

Interview – 2 (Turkish)

1- **SU:** Merhabalar hocam, tesekkur ederim geldiginiz icin?
2- **T2:** Bende tesekkur ederim.
3- **SU:** Hocam, BT'lerini derslerinizde kullaniyormusunuz?
4- **T2:** Evet kullanirim, zaman zaman kullaniyorum.
5- **SU:** Kullanmadaki amacinizi ogrenebilirmiyim?
6- **T2:** Kullanma amaci, cocuklar icin gorsel ve isitsel ogretimin daha iyi oldugunu
7- dusunuyorum. Ogrenciler daha iyi kavrayip daha iyi anlayabiliyorlar. Sadece anlatimla
8- olmuyo artik,
9- **SU:** Kullanmis oldugunuz eski tekniklerle karsilastirdiginizda en belirgin farklilik nedir
10- aciklarmisiniz?
11- **T2**: Cok sey degisti arada cok buyuk bir fark var, artik gnumuz teknolji devri, mesela daha
12- onceden teyp kullaniyordum muzik dersi icin, bil. tek. ile ilgili en onemli fark bil. tek. cok
13- hizli ve kolay bir sekilde derslerimde kullananabilmem ve cok genis kaynaklarin bulunmasi.
14- Ozellikle internetten, youtube'tan mesela bir cok materal kullanilabiliniyor.
15- **SU:** Evet..
16- **T2:** Cok hizli bir sekilde hazirligi yapip derse baslayabiliyorum.

17- **SU:** Sanirim simdi soracak oldugum soruyu cevapladiniz. BT nin rolu ile ilgili ne
18- dusunuyorsunuz ile ilgiliydi. Ogrenciler icin, egitim ve ogretim icin nasil bir fayda sagliyor
19- sizce?
20- **T2:** Bir kere, ogrencilerin cok genis bakis acisina sahip oldugunu dusunuyorum. Kendilerini
21- daha rahat ifade edebilme yetenekleri gelisiyor. Ogrencilerle internet uzerinden bilgi
22- paylasimi yapabiliyoruz, fakat herkesin evinde bilgisayar olmamasi bu tur aktivitelrin
23- sinirlandirilmasina neden oluyor.
24- **SU:** Yeterli bilgi ve becerilere sahipmisiniz, hem teknik bilgi olarak hede ogrenm teorileri ile
25- ilgili?
26- **T2:** Kendimi tam olarak yeterli bulmuyorum.
27- **.....**
28- **SU:** Okul yonetiminin tutumu nasil, BT ile ilgili olarak?
29- **T2:** Cok olumlu tutumlari var, bazen bize derslerimizde eslik ediyorlar. Kurlara katilma
30- konusunda olsun, BT ile ilgli her bilgiyi bizimle paylasiyorlar.
31- **SU:** Teknik destek konusunda neler dusuuyorsunuz?
32- **T2:** Formator ogretmen sadece okulumuzda 3 gun gorev yapiyor. Herhangi bir teknik sorun
33- ortaya ciktiginda kendisi ile telefon araciliga ile iletisim kurabiliyorum, ama cok verimli
34- omuyor, eksikligini hissediyorum.
35- **SU:** Okuldaki atmosfer nasil? BT kullamini destekleyicimi?
36- **T2:**Tabi cok olumlu, her konuda yardimlasma oluyor.
37- **SU:** BT'de kendinizi gelistirecek zamaniniz varmi?
38- **T2:** Evet var...
39- **SU:** Sanirim kendi kisisel zamaniniz.
40- **T2:** Evet, okulumuzda normal egitim ogretim sirasinda kendi bilgi ve becerilerimi
41- gelistireblecegim zamaninmiz cok kisitli. Genelde kendi kisisel zamanimizdan kullanmamiz
42- isteniyor.
43- **SU:** Umm... bildiginiz gibi, yeni mufredat gelistirildi daha cok ogrenci merkezli, eskisi ile
44- karslastirma yaparsaniz, BT ile ders islemeyi dahami cok cesaretlendiriyor?
45- **T2:** Tabiki daha iyi oldu, eskisi ogretmen merkezliydi, ogrenciler kendilerini rahat bir sekilde
46- ifade edemiyorlardi. Simdi BT ninde yardmi ile kendisinidaha iyi ifade edebiliyor. Yeni
47- mufredat planinindada BT le ilgili degisik aktiviteler bulunmakta.
48- **SU:** Tesekkurler **,** simidiki sorum**,** daha once BT ile ilgili herhangi bir kursa katildinizmi?
49- **T2:** Katildim, katildim....
50- **SU:** Nasil buldunuz?
51- **T2:** Temel bilgiler verildi bizlere, nasil kullanilacagina iliskin... Ilki 8 yil once Ankara' daydi.
52- 3 hafta kadardi. Excell ve word ile ilgiliydi. Tamamen yuzeyseldi. Genelde verilen kurslar bir
53- oncekilerin tekrari oluyor.
54- **SU:** Sinifta nasil kullanilacagina dair herhangi bir egitim yoktu yani...
55- **T2:** Malesef yoktu, ve ben onun eksikligini cekiyorum simdi. Material bulmak konusunda
56- zorluk cekiyorum. Turkce ve mufradata uygun software bulamayisimizin, derslerde bilgisyar
57- tek. etkisini azalttigina inaniyorum. Mesela gecen hafta deprem ile ilgili bir dersim vardi, ama
58- butun aramamlarima ragmen her hang bir egitim programi bulmam mumkun olmadi.... ve
59- bulduklarimizda ogrencilerin seviyesine ve derlere uygun olmali bence.
60- **SU:** Evet...
61- **T2:** Ozellikle, MEBin bizlere daha cok egitim materyalleri saglamasini istiyoruz.....
62- **SU:** Cok tesekkur ederim, zaman ayirdiginiz icin...
63- **T2:** Bende tesekkur ederim!

Appendix – D

Interview - T3

SU: Hello, welcome!
T3: Hi!
SU: I am going to ask you to answer nearly 10 questions...
T3: Okey, I am ready...
SU: The first question, do you use ICT in your teaching and learning? and What benefits does it have both teaching and learning?
T3: Yes I do, I have been using ICT for several years. Also new primary curriculum requires us to consider the use of ICT in our lessons. When we don't use, it is easy to lag behind the curriculum. And also, although ICT seems very time consuming and difficult to use in teaching and learning process, students can learn very quickly with ICT in comparison with traditional methods... so I don't need to repeat the same subject several times
SU: Thank you, I am asking the second question, what do you think about the role of ICT in teaching and learning?
T3: I believe that, I always talk with my colleagues about the role of ICT in different occasions, all students will have their own computers in the classroom, and they are going to learn through using it. Perhaps 10 or 15 years later, when teachers fully integrate ICT in their teaching and learning, we are going to use just computers instead of books and other materials. I think it is a really good thing in education for both teachers and students...
SU: Of course there is no doubt that ICT has many advantages for students that enhance the quality of teaching and learning...
T3: Definitely...
SU: Another question, do you think that you have enough ICT skills and knowledge?
T3: I think my ICT knowledge and skills are sufficient for now. However, as we know the technology is rapidly developing, like everyone, I would like to learn new things and update my skills and knowledge through participating workshops and seminars about the use of ICT. I attended this year, and I hope I will do next year as well.
SU: OK, umm... do you think that school principal supports teachers for the use of ICT?
T3: The school administration has a really positive attitude towards the use of ICT in education; they inform teachers about ICT for everything.
SU: What kind of support do you have?
T3: Umm, for example, recently, I was trying to prepare presentation through using power-point. I asked help form deputy principle, and he said ok. Especially, when I have a technical problem during the lessons, they provide technical support and try to find a solution with me.
SU: For example, if you ask school management to buy new ICT resources, what kind of responses do you expect?
T3: Definitely, they do everything that they can...
SU: Ok, do you have enough ICT resources and appropriate organisation in your school?
T3: I cannot say that there are enough ICT resources in my school. There must be at least one computer and head projector in each classroom. We bought our laptop and projector through the donations from parents and private voluntary organizations. What I am expecting from school administration is to supply computers and projectors that are connected to the Internet

for every class which does not have any chance to buy them.
SU: Have you ever used white-board?
T3: I received training about how to use it, but I have never used in my classroom. But I will...
SU: Thank you very much for these responses..., now I am going to ask a question about the support provided by ICT coordinator. Do you think about this support? Is it useful for you teaching?
T3: Our ICT coordinator is very eager to help us. She always gives seminars to encourage teachers. I think that the support from ICT coordinator is adequate in the present context. However, when teachers' expectations about using ICT in our lessons increase, I do not think she will be able to provide enough support that can satisfy teachers.
SU: Do you have supportive school environment for the use of ICT?
T3:I feel that there is a positive atmosphere that encourages the use of ICT in our school. Collaboration among teachers is at very high level; we are trying to share information and our experiences about ICT as much as we can.
SU: Do you have enough time to devote to the use of ICT? For example, if you have any free time, do you want to spend this time on developing yourself in the use of ICT?
T3: Ok, umm..., if you considered the situation of teachers in Turkey you would not ask me this question. Because of heavy workload and low wages, it is not easy to find any time for devoting the use of ICT apart from school time. However, I won't miss any opportunity to develop my skills and knowledge, if I have any chance.
SU: As you know new primary curriculum is being implemented since 2005. What do you think about the new primary curriculum reform?
T3: the first year, it was not very effective, but then it was revised last year. I think it takes the power from teachers to students in the lessons. Briefly, it changes the role of teachers in education.
SU: Ok, eh... what do you think about ICT and new curriculum?
T3: I believe that new curriculum encourages teachers to use ICT in their classroom. Students can take part in teaching and learning process more actively. Moreover, if I was to compare with old curriculum, I would say, it provides better chance to discuss and share my experiences with other teachers in the use of ICT.
SU: Thank you... have you ever attended any ICT training course?
T3:I have attended three times.
SU: how did you find them?
T3: The first two courses weren't sufficient, but the last one was much better...
SU: How was the last one?
T3: In our school, we have some workshops which are organized by ICT supervisor for the use of ICT. It was one of them. I think that receiving training in the school increases the effectiveness of workshops, as we can apply our skills and knowledge that we acquire in the workshops with our colleagues.
.....
SU: Do you think that school has enough financial support for the ICT?
T3: Unfortunately, my school doesn't have enough financial support from government according to our school principal. I believe, it is an important barrier for the implementation of ICT in school. We cannot buy new educational software or other materials immediately. However, school administration tries to minimize this financial gap by means of the donations from parents and private voluntary organization.
SU: Ok I am asking my final question. What are the students' attitudes towards ICT in education?
T3: I think students only enjoy physical education and ICT lessons, as they are the one that they can make some applications. I want to tell you one of my memories with my students 5 or 6 years ago. I was teaching science, but the students couldn't understand anything. Perhaps, because the reason was that it was very abstract or difficult subject. But now, with the help of ICT, it is very easy for students to learn the same subject even it is very difficult. This makes me feel more powerful and students more enthusiastic.
SU: Thank you very much, indeed, to append your time with me, I really appreciate you!

97- **T3:** You are welcome, thank you...

Interview - T3 (Turkish)

1- **SU:**Merhabalar, hosgeldiniz!
2- **T3:** Hosbulduk!
3- **SU:** Yaklasik 10'a yakin sorum olacak size...
4- **T3:** Tabiki buyurun...
5- **SU:** Ilk sorum, bilgisayar teknolojilerini egitim ve ogrtetiminizde kullaniyormusunuz?
6- **T3:** Evet kullanirim. Zaten yeni mufredata gore kullanilmasi gerekiyor. Kullanilmadiginda
7- mufredatta geride kalma gibi bir sorun cikabiliyor. Cocuklara en iyi ogretme bicimi yaparak
8- yasayarak ogretme bicimi oldugu icin, bilgisayar tek. derslerde kullanilmasi zahmetli gibi
9- gorunsede, cocuklara bir cok ogrenme firsati sundugundan dolayi ogrenmenin daha hizli
10- gerceklestigini dusunuyorum.
11- **SU:** Tesekkurler, iki sorumu soruyorum, bilgisarlarin egitim ve ogretimdeki rolu konusunda
12- neler dusunuyorsunuz?
13- **T3:** Ben suna inaniyorum, degisik ortamlarda ogretmen arkadaslarimla sohbetlerimizde
14- konusuyoruz hep, ogrencilerin bir cogunun onunde laptoplari olacak, cocuklar herseyi laptop
15- araciligi ile okuyacaklar. Bilgisayar teknolojilerinin tam verimle kullanilmasiyla beraber, 10-
16- 15 yil sonra defter ve kitap'larin egitim ve ogretimde onemini yitirecegni dusunuyorum.
17- Bence BT lerinin egitim ve ogretimde kullanilmasi hem ogretmen hemde ogrenci icin cok
18- onemli.
19- **SU:** Herhalde hic suphe yokki bilgisayarlar egitim ve ogretimin kalitesini artiriyor, umarim
20- ogrencilerin faydasina olur.
21- **T3:** Kesinlikle
22- **SU:** Diger bir soru, yeterli bilgi ve beceriye sahip oldugunuzu dusunuyormusunuz?
23- **T3:** Su an icin yeteneklerim yeterli oldugunu dusunuyorum, fakat herkes gibi her zaman
24- kendimi yenilemek istiyorum, firsat buldukca herzaman bilgisayar kurslarina katilmak
25- istiyorum. Bu sene katildim, onumuzdeki yilda katilmak isterim.
26- **SU:** Okul yonetiminin ogertmenlerin BT derslerinde kullanmalarina yonelik tutumununu
27- nasil? Yeterli destege sahipmisiniz? Okul
28- **T3**: Okul yonetiminin tutumu cok olumlu, bil. tek. ile ilgili olan her turlu duyuruyu yapiyorlar.
29- Talimatlari asiyorlar. Takildigimiz yerlerde soruyoruz, onlarda yapilabilecek herseyi
30- yapiyorlar.
31- SU: Hangi konularda destege sahipsiniz?
32- **T3**: En yakin ornek olarak, derslerim icin mesela powerpoint kullanarak sunum hazirlamak
33- istedim. Mudur yardimicisina gittim, ve isni birakip bana yardima geldi. Evet, dersin islenisi
34- sirasinda ozellikle teknik problemlerin ortaya cikmasi durumunda kendi islerini birakip
35- ellerinden gelen yardimi yapiyorlar.
36- **SU:** Yani teknik destekte veriyorlar...
37- **T3:** Evet,
38- **SU:** Mesela okul yonetimine gidipte, yeni bir egitim yazilimi satin almak istediginizi
39- soylediginizde tutumlari nasil oluyor.
40- **T3:** Kesinlikle ellerinden gelen herseyi, imkanlari dahilinda herseyi aliyorlar...
41- **SU:** Peki, okullarinizda yeterli olcude BT kaynaklari mevcutmu?
42- **T3:** Ben okul yonetiminede soyledim, her sinifta bir bilgisayarin, projector aletinin olmasi cok
43- onemli. Kendi sinifimdaki bilgisayari ve projector makinasini veliler ile isbirligi yaparak temin

ettik. Ama her sinifta bu sekilde alinamiyor. Okul yonetiminden beklentimiz, her sinifta internete bagli olan bilgisyar ve projector saglanmasidir. Velilerle olan toplantilarimizda BT oneminden bahsedip, yardim etmelerini istiyoruz.
SU: Elektronik tahta falan satin almayi dusunuyormusunuz?
T3: Onun egitimini almamiza ragmen kullanmiyoruz, ama insallah kullanacagiz.
SU: Tesekkur ederim hocam, simdiki sorum, formator ogretmenimizden aldiginiz destek konusunda neler dunuyorsunuz? Mesela, size BT nin kullanilamsi konusunda teoriler ile ilgili destekte bulunuluyormu?
T3: Formator ogretmenimiz cok iyi niyetli, bir cok kez BT hakkinda seminerler hazirladi. Su anki sistemde formator ogretmenin vermis oldugu destegin yeterli oldugunu dusunuyorum, ama ileride bil. tek. ile ilgili beklentilerimizin artmasi durumunda verilen destegin cokta tatmin edici olacagini dusunmuyorum.
SU: Calismis oldugunuz okulda nasil bir ortam oldugunu dusunuyorsunuz BT hakkinda?
T3: Nasil bir ortam?
SU: Yani ogretmen arkadaslarinizla olan iliskiler konusunda, nasil bir atmosfer var okulunuzda?
T3: Okulumuzda pozitif bir ortamin oldugunu dusunuyorum. Ogretmenler arasinda elimizden geldigi kadariyla birbirimizle bilgi ve deneyim paylasimi saglamaktayiz. Ozellikle benimle ayni biranstan olan ogretmen arkadaslarimla olan iliskilarimiz cok olumlu.
SU: Yeterli zamaniniz varmi peki? Mesela zamanim bol, her turlu egitimi alabilirim diyebilirmisiniz?
T3: Turkiye sartlarinda biraz zor oldugunu dusunuyorum. Ozellikle maaslarin dusuklugu nedeniyle ikinci bir is yapmamiz gerktiginden kendi kisisel zamanimizdan ICT icin kullamamamiz biraz zor gorunuyor. Ama derslerimde ICT'yi kullamayi sevdigim icin bilgi ve becerilerimi gelistirmek adina butun firsatlari kullanmaya calisirim.
SU: Bildiginiz gibi 2005 yilinda yeni mufredat hazirlandi, daha cok ogrenci merkezli olan. Eskisi ile yenisi arasinda nasil bir karsilastirma yapabilirsiniz?
T3: Ilk sene fazla etkili olamamisti, daha sonra revizyona ugradi, simdiki hazirlanan daha iyi oldugunu dusunuyorum. Ogrencilere daha cok soz hakki veriyor ve ogretmenin dersin islenisindeki rolununde degistirdigini hissediyorum.
SU: BT ile ilgili olarak ne gibi degerlendirme yaparsiniz?
T3: Yeni sistem bilgisayar kullanilmasina daha cok yonlendiriyor, cunku arastirma ve incelemeye, ogrencinin derse aktif olarak katilmasina tesvik ediyor. Bilgisayar dan bir sey gosterdigimizde bile cocuklara yorumlatiyoruz. Ogrenciler daha detayli ogreniyorlar.
SU: Daha once bilgisayar kurslarina katildinizmi?
T3: 3 tane kursa katildim.
SU: Kurslari nasil buldunuz?
T3: Ilk 2 sinden fazla bir verim alamadim. Yalasik 3 sene onceydi.
SU: Son katilmis oldugunuz nasildi?
T3: Son katildigimiz okulumuzdaki formator ogretmenin tarafindan duzenlenmisti. Simdikinin daha yarali oldugunu dusunuyorum. Meslektaslarimizla ozellikle okul oratminda kazanmis oldugumuz bilgi ve deneyimi uygulama ve paylasma imkanimizin olmasi almis oldugum egitimin etkisini artrdi.
.....
SU: Okulda yeterli finansal destek bulunuyormu bakanligin saglamis oldugu?
T3: Okul mudurumuze gore, maalesef gerekli finansal destek alamiyoruz.Bence cok buyuk bir sorun. Genellikle veliler ve egitim gonullusu olan kisiler ve kampanyalar sayesinde bu acigi kapatmaya calisiyoruz. Mesela kendi ogrencilerimize hediyeler vermekistiyoruz BT ile ilgi destekleyen, ama malesef bizim icin cok cok.
SU: Ogrencilerin tutumu nasil BT kullandiginizda?
T3: Ogrenziler en cok beden egitimi ve bilgisayar derslerini cok seviyorlar, daha cok uygulama yapildigi icin. 5-6 yil onceki bir animi anlatmak istiyorum. Su anda islemis oldugum ayni konuyu ogrencilerime bir ders boyunca anlatmaya calismama ragmen konunun cok soyut olmasindan dolayi tam olarak ogretememistim. Ama su an bil. yardimiyla hic zorlanmadan ogrencilerin en zor konulari bile cok rahat bir sekilde kayrayabiliyorlar.

99- **SU:** Cok tesekkurler hocam, zamaninizi ayirdiginiz icin...
100- **T3:** Rica ederim, bende tesekkur ederim.

Appendix – E

Interview – 4

1- **SU:** Hi, welcome!
2- **T4:** Hello!
3- **SU:** Ok, I am going to ask several questions, first one is, do you use ICT in your teaching?
4- **T4:** Yes I do,
5- **SU:** Right, what do you think about role of ICT in education?
6- **T4:** I think, students have better opportunities for their learning, they can understand the
7- subject very easily, as you know just to listen to what teacher tells is not enough for them.
8- Furthermore, ICT is really good tool that keeps students and teachers enthusiastic and
9- interested in the lessons.
10- .....
11- **SU:** What kind of changes do you observe after you started to use ICT in the classroom, what
12- benefits does it give to you?
13- **T4:** Umm..., I can say that I learned how to use computers after I started working in this
14- school. Of course there are many changes. For example, students grow up in a narrow
15- environment. They can learn many things that we obtain through ICT. They can find many
16- ways to think differently, for instance, they can find many opportunities to learn more about
17- other people and their cultures.
18- **SU:** Right, iii, do you have enough knowledge and skills in ICT? For instance, apart from
19- basic skills, do you have any knowledge and skills that you can use ICT in your teaching?
20- **T4:** Unfortunately, I don't have enough knowledge and skills in the use of ICT. For example,
21- it is difficult for me to use Microsoft Vista. My students know better than me, and help me to
22- use it accurately.
23- **SU:** How do you feel about this?
24- **T4:** I really like it. That means they are interested in the lessons.
25- **SU:** So, technical support is provided by students.
26- **T4:** Umm... Yes, but sometimes, I cannot carry on my lesson, because of the lack of
27- technical support. For example, I wanted to adjust the brightness of the projector, and then it
28- stopped working. However, it is difficult for ICT coordinator to provide such support every
29- time, as he works part-time. I would like to have a person who works full time and supports
30- us in these circumstances in the school.
31- **SU:** Ok, what do you think about the school leadership? Do they support the use of ICT?
32- **T4:** Actually, my school administration is very helpful. They do everything to support us
33- regarding ICT.
34- **SU:** Do you think that there are enough resources and appropriate organisation in your
35- school?
36- **T4:** Now, for example, despite the fact that my school has a broadband internet connection, I
37- cannot use it because of my classroom's thick walls. Also, the classroom, used as computer
38- lab, is very small and the number of students is very high. So I cannot use resources
39- efficiently. I spend nearly half of the lesson trying to organize available ICT resources for
40- students and control their behaviour. I think, this has a substantial negative influence on me
41- and my students.
42- **SU:** How do you describe the school environment for the use of ICT?

T4: I think, it is quite positive, everyone seems to be interested in ICT.
SU: Ok, eee, have you ever attended any ICT training course?
T4: I have attended two workshops that our school's ICT coordinator prepared. It was after the school and not very effective. I think it could be separated and done in a more convenient time
SU: What do you think about the attitudes of students towards the use of ICT in the classroom?
T4: They are very positive, very enthusiastic about ICT, However, there is a significant gap among students about their level of ICT literacy and having access to computers outside the schools. I think this causes inequality among them.
SU: Right, this is my last question. What do you think about the MONE and its ICT policies?
T4: I think, unfortunately, in our country policy-makers often try to impose their policy using top-down approach, perhaps, because of the education system. However, they always ignore the differences among schools and the regions of the country in terms of socio-economic situation and cultural diversity. Thus, nobody expects any educational reform to be successful in all schools. I think ICT policy must be particular for each school, and developed through taking into account the capability of schools, and socio-cultural characteristics of society.
SU: Madam, thank you very much indeed. You answer are very valuable for me.
T4: You are welcome, I thank you!

Interview – 4 (Turkish)

SU: Merhabalar, hosgeldiniz!
T4: Merhaba, hosbulduk!
SU: Evet, simdi sorulara baslayalim isterseniz, derslerinizde bilgisayar teknolojilerinden faydalaniyormusunuz?
T4: Evet yararlaniyorum.
SU: Sizce egitim ve ogretimde ne gibi bir rolu var?
T4: Cocuklar BT sayesinde gorsel ve isitsel olarak konuyu daha iyi anlayabiliyorlar, sadece anlatim yetersiz kaliyor. Bence hem ogretmenler hemde ogrenciler icin bir iyi motivasyon kaynagi diyebilirim.
.....
SU: Bilgisayar kullanmaya basladiktan sonra ne gibi degisiklikler oldu, ne gibi yararlar gordunuz?
T4: Simdi soyle soyleyeyim, bigisayar kullanmayi tam olarak bu okulda ogrendim kurslar sayesinde... Cocuklar cok dar bir cevrede yetisiyorlar, kendi aile yapilarini goruyorlar, BT araciligi ile getirmis oldugumuz bilgiler sayesinde daha iyi ogrenebiliyorlar, daha farkli dununebiliyorlar, mesela farkli insanlari dunyanin degisik yerlerinden olan kulturleri tanima firsati bulabiliyorlar.
SU: Yeterli bilgi ve ecerileriniz oldugunu dusunuyormusunuz? Mesela temel bilgileri biliyorsunuzdur, ama derslerde BT'yi daha aktif kullanimi konusunda ki bilgi ve beceriniz nasil?
T4: Malesef ikisi knusundada sikinti cekiyorum. Mesela durup, dururken goruntu gidiyor, ne yapacagimi bilemiyorum, Microsoftun vistayi kullaniyorum mesela biraz zor gibi geliyo, ogrencilerim bana sag tusa basin, ozellikelri secin gibisinden yardim ediyorlar.
SU: Ne hissediyorsunuz bu konuda?
T4: Cok hosuma gidiyor, demek ki, derslere ilgileri artiyor.
SU: Teknik destegi sanirim cocuklar sagilyorlar.
T4: Evet, ama teknik destegin cok onemli oldugunu dusunuyorum. Bu yuzden bazen BT ile derslere devam edemiyorum. Mesela projektorun parklakligini ayarlamak benim icin buyuk bir sorun ve formator ogretmenin bana aninda destek saglamsi cok guc yari zamanli calistigi icin. Teknik bilgi ve destek saglayacak okulumuzda tam zamanli calisan birisinn olmasinin cok olumlu bir faktor olacagini dusunuyorum....

SU: Okul yonetimi ile ilgili neler dusunuyorsunuz? BT konusunda destekleyici oluyorlarmi?
T4: Belirli bir plan cercevesinde bize bil. kaynaklari ve hizmet ici egitim konusunda gerekli olan destegi saglamaktalar.
SU: Okulunuzda yeterli kaynaklar varmi, yada olan kaynaklarin kullanimi verimlimi?
T4: Simid mesela, okulumzda internet olmasina ragmen okulumuzun duvarlarinin cok kalin olmasi nedeniyle ve sinifimin uzak olmasi nedeniyle internete erisim imkanim yok. Ustelik bilgisayarlarin kullanimi icin ayrilmis olan siniflarin kucuk olmasi, sinif mevcudununda kalabalik olmasi ve elimizde bulunan materyallerin etkili bir sekilde kullanimini yapamamamiz nedeniyle genellikle ortaya cikan sorunlardan ugrasmaktan ogrencilere egitim ve ogretim icin gerekli olan zamani ayiramiyorum, ve bu beni olumsuz etkiliyor.
SU: Okuldaki atmosferi nasil buluyosunuz?
T4: gercekten bu okulda teknolojiyi kullanmamiz destekleniyo, herkes cok ilgili.
SU: Evet, eeee, daha once bilgisayar kurslarina katildinizmi?
T4: Formator ogretmenizin hazirlmais oldugu iki kursa katıldim. Okul cikisi yapilmasi nedeniyle cokta verimli oldugunu dusunmuyorum. Daha genis bir zamana yayilmasi daha iyi olabilir.
SU: Sizce ogrenclerin BT ile ilgili tutumu nasil?
T4: Umm, cok olumlu, cok hevesliler, ama bununla birlikte, ogrencilerimin arasinda bil. okul yazarliginin ve okul disinda bilgisayara erisim imkanlarini esit degil bence buyuk.bir engel olusturmakta.
SU: Evet, son sorumuz, milli egitimin BT ile ilgili tutumu hakkinda neler dusunuyorsunuz?
T4: Bence milli egitimin tarafindan tepeden inme ploitikalarin uygulanmasi, okullar ve bulunduklari toplum arasinda farkliliklarin cok olmasi nedeniyle cokta verimli olmamakta. Her okulun kendi ICT ile ilgli plan ve programlarini kendi sahip olduklari kaynaklara ve toplumun yapisina gore yapmalari basari icin onemli oldugunu dusunuyorum.
SU: Hocam tesekkur ederim, soylediklerniz calismam icin gercekten cok yararliydi.
T4: Bende tesekkur ederim.

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