BARRIERS AND ENABLERS OF TECHNOLOGY INTEGRATION INTO
INSTRUCTION IN THE KYRGYZSTAN-TURKEY MANAS UNIVERSITY

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

BY

GULSHAT MUHAMETJANOVA

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

JANUARY 2014

Approval of the thesis:

BARRIERS AND ENABLERS OF TECHNOLOGY INTEGRATION INTO INSTRUCTION IN THE KYRGYZSTAN-TURKEY MANAS UNIVERSITY

submitted by **GULSHAT MUHAMETJANOVA** in partial fulfillment of the requirements for the degree of **Doctor of Philosophy in Computer Education and Instructional Technology Department, Middle East Technical University** by,

Prof. Dr. Canan Özgen
Dean, Graduate School of **Natural and Applied Sciences**

_____

Prof. Dr. Soner Yıldırım
Head of Department, **Comp. Edu. & Inst. Tech.**

_____

Prof. Dr. Kürşat Çağıltay
Supervisor, **Comp. Edu. & Inst. Tech. Dept., METU**

_____

Examining Committee Members:

Asst. Prof. Dr. Hasan Çakır
Computer Edu. & Inst. Tech. Dept., Gazi University

_____

Prof. Dr. Kürşat Çağıltay
Computer Edu. & Inst. Tech. Dept., METU

_____

Prof. Dr. Soner Yıldırım
Computer Edu. & Inst. Tech. Dept., METU

_____

Assoc. Prof. Dr. Erdinç Çakıroğlu
Elementary Education Dept., METU

_____

Asst. Prof. Dr. Gülfidan Can
Computer Edu. & Inst. Tech. Dept., METU

_____

Date: *23/01/2014*

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Name, Last name : Gulshat
Muhametjanova

Signature :

ABSTRACT

BARRIERS AND ENABLERS OF TECHNOLOGY INTEGRATION INTO INSTRUCTION IN THE KYRGYZSTAN-TURKEY MANAS UNIVERSITY

Muhametjanova, Gulshat

Ph.D., Department of Computer Education and Instructional Technology

Supervisor   : Prof.Dr. Kürşat Çağıltay

January, 2014, 118 pages

The purpose of this study was to determine the barriers and enablers of technology integration according to students and instructors, investigate how Information and Communication Technologies (ICT) are used by instructors and students in education in the Kyrgyzstan-Turkey Manas University. Mixed-method research was used by collecting data via questionnaires from 477 students and 57 instructors, and interviews with 11 students and 9 instructors.

The results show that there is still deficiency of laboratories, instructors' lack of knowledge and experience about technology, deficiency of hardware and software, and lack of qualified technical personnel. The cost of personal computer; problem with Internet connection are still perceived barriers for students.

The results of this study can be used by the Kyrgyzstan-Turkey Manas University, Ministry of Education, and other universities in Kyrgyzstan. Furthermore, the results can contribute to the literature on the use of ICT in Kyrgyzstan.

Keywords: Information and Communication Technology (ICT), technology integration, barriers, enablers, Kyrgyzstan

ÖZ

KIRGIZİSTAN-TÜRKİYE MANAS ÜNİVERSİTESİNDE ÖĞRETİME TEKNOLOJİ ENTEGRASYONUN ÖNÜNDEKİ ENGELLER VE OLANAKLAR

Muhametjanova, Gulshat

Doktora, Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü

Tez Yöneticisi   : Prof.Dr. Kürşat Çağıltay

Ocak, 2014, 118 sayfa

Bu çalışmanın amacı, öğrenci ve akademisyenler açısından teknoloji entegrasyonu ile ilgili engelleri ve olanakları tanımlamak, Kırgızistan-Türkiye Manas Üniversitesi'ndeki eğitim sürecinde Bilgi ve İletişim Teknolojileri'nin öğrenci ve akademisyenler tarafından nasıl kullanıldığını araştırmaktır. Bu çalışmada, 477 öğrenci ve 57 akademisyenden anket toplanarak; 11 öğrenci ve 9 akademisyenle mülakat yapılarak karma araştırma metodu kullanılmıştır.

Sonuçlar, hala laboratuar sayısında eksiklikler olduğunu, akademisyenlerin teknoloji ile ilgili bilgi ve tecrübe konusunda yetersiz olduğunu, gerekli donanım ve yazılımın eksikliğini ve vasıflı teknik personel yetersizliğini göstermektedir.

Bilgisayar maliyetleri ve Internet bağlantısı problemleri öğrenciler için hala engel teşkil etmektedir. Bu çalışmanın sonuçları Kırgızistan-Türkiye Manas Üniversitesi'nde, Milli Eğitim Bakanlığı'nda ve Kırgızistan'daki diğer üniversitelerde kullanılabilir. Ayrıca, bu sonuçlar Kırgızistan'da Bilgi ve İletişim Teknolojileri kullanımı hakkındaki literatüre katkı sağlayabilir.

Anahtar Kelimeler: Bilgisayar ve İletişim Teknolojileri (BİT), teknoloji entegrasyonu, engeller, olanaklar, Kırgızistan

To My Mother

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

LIST OF TABLES

TABLES

LIST OF FIGURES

FIGURES

ABBREVIATIONS

CDF	Comprehensive Development Framework
GDP	Gross Domestic Product
ICT	Information and Communication Technology
HPE	Higher Professional Education
OECD	Organization for Economic Cooperation and Developments
PISA	Programme for International Student Assessment
UNESCO	United Nations Educational, Scientific and Cultural Organization
USTDA	US Trade Development Agency

CHAPTER 1

INTRODUCTION

This section presents background of the study, purpose of the study, the research questions, significance of the study, and definition of terms used in the study.

1.1. Background of the Study

Within the technological developments Information and Communication Technologies (ICT) become more popular, and educational policy makers invest more in technology, to integrate it into the learning process. By investing in technology, educational policy makers are expecting that both instructors and students will benefit from it, by using it to increase the quality of education. However, there are a number of factors preventing use of technology in education, like lack of training, lack of time, lack of equipment (Beggs, 2000; Newhouse, 1999; Ertmer, 1999).

According to ITU report (2013) the number of people using Internet by the end of 2013 is estimated to be over 2.7 billion (39% of the world's population). Out of this number 77% of the population is from developed countries, and only 31% from developing. Statistics reveal that there is a digital inequality in developed and developing countries in terms of ICT and internet penetration rate. Poor countries have a little or no access to the Internet, while in industrialized countries the number of people connected to the Internet is rapidly growing (UNESCO, 2005). In order to promote the development of Knowledge Societies, there is a need to overcome digital inequalities.

Studies conducted in developing countries on use of ICT in education show that major barriers were: lack of hardware, lack of technical support (Goktas, 2004; Al-Senaidi, 2009; Keengwe et al. 2008), lack of in-service training about ICT (Willis, Thompson & Sadera, 1999; Shrum, 1999; Goktas, 2004; Muhametjanova& Çagıltay, 2012), inadequate repertoire of knowledge and skills on the integration of ICT into instruction, and lack of basic knowledge-skills (Goktas, 2004; Pelgrum, 2001; Ihmeideh, 2009; Muhametjanova & Çagıltay, 2012), mismatch between ICT and existing curricula, and teachers low level of access to computers (Albirini, 2006), lack of time (Al-Senaidi, 2009; Albirini, 2006).

Kyrgyzstan is a developing country, with population of 5.582 million (2012) and total expenditure on education 19.3 KGS billion (390 293 225 USD), and on Higher Educational Institutions 2.9 billion (58 645 096 USD) which is 15% of GDP in 2011. Kyrgyzstan has increased expenditure on education significantly: from 3.9 % of GDP in 2001, 5% in 2005, to 6.5% in 2007 (Tempus Report, 2012).

The expenditure on education is very high, while according to Program of International Student Assessment (PISA) report of 2006 and 2009 Kyrgyzstan was ranked last in the Program of International Student Assessment. The number of computers in schools is very low, and use of ICT is restricted to the teaching of informatics and computers skills. Some of the reasons are lack of adequate financial resources in school budgets, and lack of technical access to the Internet (Asian Development Bank, 2012).

However, only a few research was conducted to measure the level of ICT use in Higher education in Kyrgyzstan, to see the level of ICT use of instructors, and students, while "ICT can act as a tremendous facilitator of the speed with which knowledge is developed....ICT can assume such a role as a result of its ability to package and move around information within the factories of meaning and between them" (UNESCO, 2005, p 49).

This study was conducted in the Kyrgyzstan-Turkey Manas University, which is established in 1995. Kyrgyzstan-Turkey Manas University is a public university with 2 official languages of instruction: Kyrgyz and Turkish. There are 8 faculties in university (Faculty of Education, Faculty of Engineering, Faculty of Economics and Administrative Sciences, Faculty of Communications, Faculty of Agriculture,

Faculty of Science, Faculty of Arts, Veterinary Faculty, and 6 higher schools (School of Foreign Languages, Tourism and Hotel, Conservatory, Physical Education and Sports, and Vocational School). At the beginning of 2013-2014 academic years there were total 4481 students in different faculties and high schools (Manas University, 2013). The total number of instructors is 526 with 133 from Turkey, 245 from Kyrgyzstan, and 4 other countries (Manas University Report, 2011). One of the missions of the university is: "To serve as a model for the higher education system of Kyrgyzstan, and in this way to play a leading role in global integration by making use of contemporary education standards and methods in a modern university administrative model" (Manas University, 2009).

Kyrgyzstan-Turkey Manas University has the following technological infrastructure: in 2010-2013 years 370 personal computers, 37 notebooks, 40 printers and 49 projectors have been bought. Furthermore, 9 existing laboratories were improved, and 29 new laboratories were opened. (Manas University, 2013). However, with this technological insrastructure, it is not known how much and how technologies are integrated into the process of instruction, how it is used by instructors, as well as by students, what kind of barriers exist preventing efficient and effective use of this technology into instruction.

Higher Educational Institutions play a crutial role in the transformation to Knowledge Society. Investigating the current status of ICT use in the Kyrgyzstan-Turkey Manas University, identifying possible barriers and enablers can be used for the future improvements in the field of ICT, and consequently in transition to Knowledge Society.

1.2. Purpose of the study

The purpose of this study is to define the barriers and enablers of technology integration into instruction perceived by students, and instructors; to investigate the level of use of ICT by instructors, and students, to see level of Competency to use ICT by instructors and students in Kyrgyzstan-Turkey Manas University; to understand the general picture on the use of ICT for instruction in one of the universities in Kyrgyzstan.

1.3. Research Questions

The main research questions of this study are presented below:

1   What are the barriers of technology integration into instruction in Manas University?

    1.2 What are instructors' perceptions of barriers of technology integration into instruction in Manas University?

    1.3 What are students' perceptions of barriers of technology integration into instruction in Manas University?

2   What are the enablers of technology integration into instruction in Manas University?

    2.1 What are the enablers of technology integration into instruction in Manas University according to instructors?

    2.2 What are the enablers of technology integration into instruction in Manas University according to students?

3.   What are the perceived ICT and Computer competencies of instructors and students?

4.   To what extent instructors and students use ICT during education?

    4.1 What is the level of ICT use of instructors?

    4.2 What are the students' perceptions about ICT use in Manas University?

    4.3 What are the expected ICT uses during instruction according to students?

1.4. Significance of the Study

This study can contribute to the Kyrgyzstan-Turkey Manas University administration by proposing the policies and strategies that Manas University can follow for successful technology integration into instruction. Furthermore, it can contribute to the Ministry of Education, which can use the model of ICT integration in Manas University as an example, and apply the necessary strategies and policies that should be used in other public universities in Kyrgyzstan. Other universities that would like to find their place in the Kyrgyzstan's' educational arena can also benefit

from results of this study, by considering the proposed policies and strategies for effective use of ICT during instruction.

There is a need for this type of research in Kyrgyzstan, since in spite of the developments and investments in ICT, specifically in public universities, no similar research was conducted before to see whether investments in technology enhance process of learning; what barriers prevent efficient use of technology into instruction; what instructors think about technology integration. So, this research study is conducted to answer those questions. The findings of the study will contribute to the literature on the use of ICT in Kyrgyzstan, and can be used by Kyrgyzstan-Turkey Manas University, Ministry of Education, and other universities in Kyrgyzstan.

Furthermore, today all developed countries are approaching to be a Knowledge Society, and for Kyrgyzstan to become a Knowledge Society it is a prerequisite to understand the current status of ICT in higher education to make further developments and improvements both for instructors, and students.

1.5. Definition of terms

Information and Communication Technology (ICT): ICT is a convergence of computers and digital communication to enable access to information and other resources and to facilitate the communication and collaboration.

ICT Integration: ICT integration into education is defined for the current study as using ICT effectively and efficiently by whole stakeholders in all fields of education. The meaningful ICT integration knows when, why, and how specific tools should be used to facilitate learning. It needs together ability to plan and select the optimal application tools, as well as the knowledge and skill to implement and evaluate their effectiveness (Newby, Stepich, Lehman, & Russell, 2006).

Instruction: Instruction is defined as a whole process of education within and out of classroom.

Knowledge: Knowledge is defined in two forms: Explicit and Tacit Knowledge. Explicit Knowledge (information) is the knowledge that can be easily combined, retrieved, and transmitted in different ways, including modern ICT. Tacit

Knowledge is a mix of experience, values, contextual information and expert insights, which allows individual to evaluate and incorporate new experience and information. Tacit Knowledge does not have boundaries, it dynamic and intangible. It is difficult to formalize and difficult to communicate or share with others. «Tacit Knowledge is information combined with experience, context, interpretation and judgement. It is acquired through one's own experience or reflections on the experience of others" (p.19, United Nations, 2005)

Knowledge Society: Knowledge Society is defined as Society where knowledge is the most important production factor, where information is used and applied in various fields for learning and development of society. A Knowledge Society is well connected via ICT, and has access to relevant and usable information (Britz et al, 2007)

CHAPTER 2

LITERATURE REVIEW

This chapter presents literature review related with this study and has nine main sections: (1) ICT in Knowledge Society, (2) ICT and Higher Education, (3) Barriers and enablers for ICT Integration into Education, (4) Kyrgyzstan, (5) ICT and Knowledge Society in Kyrgyzstan (6) Profile of Higher Education in Kyrgyzstan (7) Kyrgyzstan-Turkey Manas University, (8) ICT in education in Kyrgyzstan and Post Soviet Counties (9) Summary and Gap in the Literature.

2.1. Information and Communication Technology (ICT) in Knowledge Society

Continous developments and innovations in ICT lead world to transform from Information Society to Knowledge Society, where ICT is only valuable as a *means* to achieve Knowledge Societies (UNESCO, 2005). According to Lor & Britz (2007), for a community to become a part of Knowledge Society the following interrelated pillars should exist:

1) ICT Infrastructure

   A well-developed, well-maintained, and affordable ICT infrastructure is a prerequisite for successful participation in a Knowledge Society

2) Human intellectual capability

   Human intellectual capability is one of the most important factors which facilitate development and economic growth.

3) Physical delivery infrastructure

   This includes well maintained airport, harbors, railways, roads, warehouses, and physical addresses of people.

4) Information Content

Relevant information which include affordability, timeliness, and presentation in languages, and content which users can understand.

In Knowledge Society ICT has potential to increase access to educational resources, improve the quality of learning, and improve management efficiencies of education system (Gesci, 2009).

United Nations (2005) stated in their report that there are two main assets of Knowledge society: people and information. They conducted a survey to answer the following questions: How many people can a society count on and leverage to produce and use knowledge? And degree to which people can contribute to the process of knowledge production and use. It was represented by people's characteristics like education, skills, experience, creativity etc.

Two indicators were selected to answer the questions above, which are the expected years of schooling of a population, and the share of population in a society that is below 15 years of age. 'These two indicators are meant to capture the ability of a country to continuously feed and renew its "stock" of people who, through education, can expand their tacit knowledge and, it is hoped, develop as creative beings' (Understanding Knowledge Societies, p. 29,).

To measure information asset a) Number of newspapers per thousand people, b) number of internet users per ten thousand people, and c) combined indicator that incorporates the number of main telephone lines and cellular phone subscriptions per hundred people were used.

The results of the survey showed that countries with higher GDP per capita are in better position in terms of overall current assets for the Knowledge Society (Table 2-1), while countries with lower GDP have higher pools of young population. As it can be seen from Table 2-1 developed countries like Norway, Sweden, Japan, USA, and Germany are in the top 20 countries.

For developing countries to transform to Knowledge Society investments in education, innovation systems, infrastructure (which includes ICT) and implementation policies that support transformation to Knowledge Society are

required. Education is of critical importance for building Knowledge Society, as a foundation for the development of new knowledge and innovation (Gesci, 2009).

Table 2-1: Top 20 countries with the highest Assets Index

The Assets Index

	Country Name	Assets Index	Expected Schooling	Young Pop. (<15)	Newspapers per 1000 Pop	Internet users per 10,000 Pop	Phone +Cells
1	Norway	0.801	1.000	0.192	1.000	0.876	0.935
2	Sweden	0.749	0.907	0.124	0.755	1.000	0.960
3	Finland	0.714	0.981	0.125	0.772	0.887	0.805
4	Republic of Korea	0.683	0.870	0.237	0.666	0.963	0.682
5	Denmark	0.656	0.824	0.140	0.521	0.894	0.898
6	Netherlands	0.652	0.917	0.142	0.516	0.883	0.803
7	Japan	0.648	0.759	0.012	0.983	0.782	0.706
8	Australia	0.645	0.991	0.208	0.494	0.840	0.695
9	United Kingdom	0.644	0.944	0.146	0.556	0.737	0.836
10	USA	0.618	0.852	0.231	0.357	0.962	0.687
11	Israel	0.614	0.806	0.442	0.489	0.523	0.813
12	New Zealand	0.611	0.954	0.269	0.362	0.844	0.624
13	Switzerland	0.602	0.833	0.086	0.569	0.610	0.913
14	Germany	0.590	0.852	0.039	0.525	0.717	0.817
15	Austria	0.566	0.806	0.077	0.499	0.713	0.738
16	Canada	0.551	0.824	0.154	0.264	0.894	0.621
17	France	0.529	0.861	0.151	0.367	0.545	0.719
18	Belgium	0.519	0.917	0.101	0.266	0.570	0.742
19	Ireland	0.502	0.815	0.241	0.249	0.470	0.735
20	Italy	0.482	0.815	0.000	0.170	0.613	0.814

Source: United Nations (2005).

2.2. ICT in Higher Education

Investments in ICT have increased since personal computers were introduces in hope that faculty can integrate them into classroom instruction to enhance students learning. However, only few instructors integrate computers into their teaching in way that can maximize student learning (Cuban, 2001).

According to Kozma (2008) there are four strategic educational ICT policy rationales that used to justify investements of funds on educational ICT:

1. Support economic growth

   '*Corresponding education policies can connect the use of ICT to the development of students' ICT skills which can be applied in the workforce, to develop their capacity to use technology to solve complex real-world problems that can contribute to productivity, and to their development of new kinds of "21st century" and lifelong learning skills which support knowledge creation, innovation, and entrepreneurialism in a "knowledge economy"*'(Kozma, p. 2005). For example, Singapore launched ICT plan in 2002, and 2006 which integrated ICT with changes in curriculum, instruction, assessment to prepare students to participate in country's knowledge economy.

2. Promote social development

   Most of the countries focused on potencial of social impact of ICT, and ICT investements were justified to share knowledge, increase democratic participation, and enhance integration of different cultural groups and individuals with different abilities.

3. Advance education reform

   This includes curriculum reforms with emphasis on high levels of understanding of key concepts to solve real-world problems. The role of teachers is to support and structure practices of students.

4. Support education management

   Countries support the use of ICT to improve management efficiencies or accountability of schools or education system. Policies emphasize computer-based testing and use of management systems and digital data.

   Today, policy-makers continue to invest in ICT, while critics view investments as wasteful (Oppenheimer, 2003) and suggest that it would be better to train teachers on how to improve their pedagogical skills in the classroom. According to Yıldırım (2000) teachers who receive higher levels of appropriate technology training are better prepared to integrate technology into their curriculum.

   Many schools and colleges continue to invest more in computers because they promise new dimensions to student learning and diverse opportunities for educational reformation through technology (Becker, 2001). Technology provides

opportunity to prepare learners for the needs of future workforce. According to Hill and Hannafin (2001), technology continues to transform and shape contemporary society – changing the way we work, learn, and live. However, little and insignificant changes have occurred in the use and integration of computer technology in the classroom (Ertmer, 1999; Cuban, 2001).

There are a number of key factors influencing teachers' integration of technology into instruction, such as their attitudes toward teaching and learning (Cuban, 2001), their beliefs about instructional process (Ertmer, 1999). Furthermore, such factors as lack of time, lack of equipment, lack of training were defined by Beggs (2000) and Newhouse (1999) as barriers to technology integration.

Computer technologies have a great potential to enhance teachers teaching skills and students' achievement if it is used appropriately. They can empower students with thinking skills and learning skills, improve students' affective and cognitive outcomes (Waxman & Huang, 1996).

Rogers (1999) states that power of technology to support learning depends not so much on technology rather in what instructors do with available technologies. The most effective way to benefit from technology is to integrate it into curriculum as opposed to integrating curriculum into the technology.

Technology might be a tool to support active, inquiry-based learning supported by technology-based tools such as database, analytic software, and composition software (Becker, 2000). Technology can enable students to become:

- Capable information technology users;
- Information seekers, analyzers, and evaluators;
- Problem solvers and decision makers;
- Creative and effective users of productivity tools;
- Communicators, collaborators, publishers, and producers; and,
- Informed, responsible, and contributing citizens. (ISTE, 2000)

11

2.3. Barriers and Enablers of ICT integration in Higher Education

In spite of the fact that ICT becoming more accepted in modern classrooms, problem of integration them into teaching and learning is a critical issue still. It might be due to the following barriers of ICT integration.

There are external and internal barriers for ICT integration according to Ertmer (2001). Lack of equipment, unreliability of equipment, lack of technical support and other resource-related issues are external barriers. Organizational culture, teacher-level factors as their beliefs about teaching and openness to change are internal barriers to ICT integration (Ertmer, 2001).

Another studies (Beggs, 2000; Newhouse, 1999; Larson, 2003; Al-Senaidi, 2009) reported as barriers to technology integration lack of training, lack of time, and lack of equipment. Some faculty were unable to make appropriate use of technology in their own classrooms and unwilling to try because factors such an anxiety, lack of interest, and lack of motivation. In a study conducted by Cuban (2001) at Stanford University, which has a rich technology major barriers were lack of time and lack of technical support. Nicolle (2005) found that faculty members' attitudes and motivation toward ICT and change play a big role in how they integrate ICT.

The following barriers were mentioned by Cuban, Kirkpatrick, and Peck (2001) to use technology more innovatively: (1) lack of teachers' time teachers to find and evaluate software; (2) lack of training; (3) available training did not meet needs of the teachers.

Cuban (2001) states that computers have been oversold by policy-makers and advocates of technology use in education, but was not integrated effectively into instruction. In spite of the increased access to computers it did not change existing traditional teaching style of faculty, who resist adopting new teaching style. Moreover, Oppenheimer (2003) states that in spite of the technology's lack of success in the US schools, many Americans still prefer invest in technology rather than teachers.

Cuban (2001) also mentioned teachers' attitudes and lack of preparedness to IT applications as barriers to efficient ICT integration in teaching and learning. Cuban suggested that "policymakers and administrators must understand teachers' expertise

and perspectives on classroom work and engage teachers fully in the deliberations, design, deployment, and implementation of technology plans" (p. 183).

Moreover, technical support and professional development need to be redesigned to make it more "responsive to the organizational incentives and workplace constraints teachers face" (Cuban, 2001, p. 183).

Larson (2003) conducted a study on ICT integration in California State University. Specifically, usefulness of a technology-mentoring program to integrate ICT into the teachers' education program was examined. Qualitative and case study approaches were used by Larson, 4 mentors and 4 mentees were randomly selected to participate in the study to look at mentees' perceptions of technology-mentoring programs, ways to change their courses to integrate technology, and ways in which technology could enhance learning. Findings revealed that time, fear, and technical issues were considered major challenges for technology integration by faculty mentees. It is also reported that the faculty mentees perceived that technology can enhance learning in many ways.

Larson's (2003) findings were further supported by another study that was conducted by Brill and Galloway (2007) on faculty members' perceptions of ICT use in higher education. Survey and interview were used for Brill and Galloway study.

Brill and Galloway used a survey and interviews to investigate instructors' attitudes toward teaching with ICT in a large public university in the United States. Results from their study revealed that most of the instructors feel that technology they use in their classrooms has a positive influence on their teaching and students' learning. Moreover, as the main barriers to ICT integration in the classroom were accessibility and classroom environment.

Nicolle (2005) examined the adoption of ICT into teaching and learning by faculty members. Quantitative survey was used to determine ICT adoption and usage patterns, and qualitative interview data to learn more about institutional practices and support related to ICT integration. The focus of the study was on institutional support, institutional resources, and peer supports related to the process of ICT integration into teaching and learning. The results show that faculty members

recognized that ICT can enhance teaching and learning, and that peer interactions can contribute effectively to the ICT integration process.

Ramcharan (2006) conducted another study using mixed-method approach to measure whether ICT improve students' academic performance or not and examined the IT need at a small liberal arts university. It was focused on students' perspectives. Experimental pretest-posttest design was used, with 96 first-year students from six different classes. Qualitative survey and formal interviews were conducted as well. Results show that ICT integration was beneficial and improved students' academic performance.

Laogue (2003) conducted a study to examine the influence of faculty members' ICT beliefs on instructional practices. Participants were professors from a small university. Online survey, and open-ended interview, professional development records, and course materials were used as data collection methods. No indication that technology influence instructional practices and that culture was the key to integrating technology into the classroom was concluded.

However, another research study findings that was conducted by Diehl (2005) contradicts to Loague's (2003) conclusions. Relationship between specific faculty variables and teaching with ICT were examined by Diehl. Quantitative approach and survey were used to collect data. Participants of the study were higher education faculty members from southeastern Texas. Results revealed a significant relationship between teaching practices with ICT and the variables of ethnicity, experience, and age.

Bennett and Bennett (2003) conducted a study to identify characteristics influencing faculty members' technology integration. The results indicate faculty members' reluctance and disbelief in the use of technology.

Furthermore, there are a lot of another studies conducted to see the barriers of ICT in education. Jones (2004) conducted a literature review on barriers in ICT, which is presented in Table 2-2.2.

Table 2-2: Barriers in ICT (Jones, 2004)

Studies	Barriers
Kirkwood et al(2000); Soneyink and Ertmer (2001)	Lack of teacher competence Lack of time for training
Simpson et al (1999); Veen (1993)	Lack of pedagogical training
Lee (1997); Preston et al. (2000); Manternach-Wigans et al. (1999)	Lack of skills training
Murphy and Greenwood(1998); Cuckle and Clarke (2002)	Lack of ICT focus in initial teacher training
Mumtaz (2000)	Lack of access to resources
Pelgrum (2001); Guha (2000); Pelgrum (1999)	Lack of hardware
Pelgrum (2000); Fabry and Higgs (1997); Manternach-Wigans et al. (1999); Ofsted (2002)	Poor organisation of resources
Preston et al. (2000); Fabry and Higgs (1997);	Poor quality hardware
Guha (2000); Bosley and Moon(2003)	Inappropriate software
Ross et al. (1999); Cox et al. (1999); Guha (2000);	Lack of personal access for teachers
Fabry and Higgs (1997); Manternach-Wigans et al. (1999); Preston et al. (2000); Cuban et al. (2001);	Lack of time
Bradley and Russell (1997); Cuban et al. (2001);	Technical problems
Cuban (1999); Butler and Sellbom (2002); Preston et al. (1999); Snoeyink and Ertmer (2001)	Lack of technical support
Albaugh (1997); Veen (1993); Ertmer (1999); Snoeyink and Ertmer (2001); Mumtaz (2000); Dawes (2000); Cuban et al. (2001);	Resistance to change & negative attitudes
Snoeyink and Ertmer (2001); Cox et al. (1999); Yuen and Ma (2002); Robertson et al. (1996);	No perception of benefits
Harrison et al. (2002); Somekh et al.(2002)	Impact of public examinations
Bradley and Russell (1997);	Age differences
(European Commission, 2003); Bradley and Russell (1997)	Gender differences

Studies conducted in developing countries on use of ICT

Goktas (2004) conducted a study to identify faculty member ICT competencies, barriers and possible enablers of ICT for faculty members in Turkey. 111 faculty members participated in the study. Results indicated that faculty members perceived lack of hardware, lack of appropriate software and materials for instruction, lack of computer acces for students out of clas, lack of technical support, lack of in-service training about ICT, inadequate repertoire of knowledge and skills on the integration of ICT in instruction, and lack of basic knowledge-skills as major barriers.

In addition, Al-Senaidi et al (2008) conducted a study to investigate perceived barriers to adopting ICT in higher education. 100 faculty members from different departments of Omani university participated in the study. The following factors were identified as perceived barriers: lack of equipment, lack of institutional support, disbelief of ICT benefits, lack of confidence, and lack of time.

Furthermore, another study was conducted by Albirini (2006) to investigate teachers' attitudes toward ICT and the relationship of teachers' attitudes to a set of variables in large Syrian province. Results indicated that teachers had positive attitudes toward ICT, and there was a positive correlation between teachers' attitudes toward ICT and their perceptions of computer attributes. As barriers to technology integration perceived by teachers was a mismatch between ICT and the existing curricula, lack of time, low level of access to computers.

Different study was conducted by Usluel, Aşkar and Baş (2008) using structural equation modeling to measure faculty members ICT usage in Turkey. Results show that faculty members use ICT the most as a means of communication, and for doing research; while they use ICT the least, for publishing lecture notes.

Gülbahar (2008) conducted a study to examine the factors contributing to the use of ICT by preservice teachers in private university in Turkey. 2 different questionnaires were applied to university academic staff and preservice teachers. Results indicated that both academic staff and preservice teachers have a positive

attitude toward ICT use. As barriers lack of time to attend professional development projects due to course overload, low quality of computer courses, and lack of classroom to use ICT were the major barriers to the use of ICT in education.

Goktaş, Yıldırım and Yıldırım (2009) conducted a study to idenfity barriers and possible enablers of ICT integration of pre-service teacher education programs in Turkey. The findings indicated that lack of in-service training, lack of appropriate software and materials, and lack of hardware were the main barriers for integrating ICTs in pre-service teacher education programs; and perceived enablers were "having technology plans","allocating more budget", "allocating specific units and personnel for peersupport," and "offering in-service training".

Vajargah, Jahani and Azadmanesh (2010) conducted a survey research to measure scope of ICT use in Iranian University. 231 University academics, curriculum planners and ICT professionals participated in the study. Results show that lack of National Policy for using ICT in Higher Education, lack of adequate investments, cultural obstacles, financial challenges, lack of training were the major barriers to use ICT.

In addition, Shaikh and Khoja (2011) conducted a Delphi study to examine the problems faced by the Pakistani Higher Education System in integration of ICT in Pakistan. Results showed that inadequate technological infrastructure, lack of staff skills and tranining, lack of ICT competencies amongh support staff are the major challenges in integration of ICT in higher education.

There are a lot of other studies that indicated different barriers: lack of ICT facilities as a barrier to technology integration (Lee, 2000; Beggs, 2000; Butler & Sellbom, 2002), lack of training (Willis, Thompson & Sadera, 1999; Shrum, 1999; Balanskat et al, 2006; Goktas, 2004), teachers' lack of knowledge and skills about ICT was a barrier (Pelgrum, 2001; Al-Oteawi, 2002), lack of time (Al-Senaidi et al 2008; Afshari et al, 2009), lack of technical support (Tong &Trinidad, 2005); lack of teacher confidence (Dawes, 2001).

In summary, the following major barriers were identified in the use and integration of computer technology in the classroom: lack of time, lack of funding, lack of computers and relevant quality software, technical problems, attitudes of teachers toward computers, lack of teacher confidence, and resistance to change, poor administrative support and poor training. This information will help in identifying what kind of barriers and enablers exist in Manas University, and what are the reasons and ways to overcome the specified barriers.

2.4. Kyrgyzstan

Kyrgyzstan is a mountainous country with population of 5.582 million (2012). It has predominantly agricultural economy with cotton, wool, tobacco and meat as a main agricultural product. Gold, mercury, electricity, and uranium are industrial exports.

System of Education in Kyrgyzstan is a multilevel with the following three main types of education programs:

- Special educational programs for infant preschool institutions;

- Public programs, which have a purpose of development of general culture and intellect of a person, creation of a base for successful profession acquirement and obtaining of a qualification ;

- Professional programs, providing gradual growth of professional level, preparation of qualified specialists.

Compulsory minimum of each educational program is defined by correspondent state education standard (Ministry for Education, Science & Culture of the Kyrgyz Republic, 2009).

These programs are implemented in the network of education institutions of different types, kinds and forms of property, full time, part time and non-residence forms of education.

As it is shown in Figure 2.4-1, system of Education in Kyrgyzstan has the following stages:

Pre-school education: children attend starting from 1.5-3 years and as *infant schools* and at 3-7 years as *kindergartens*.

*School education***:** there are three stages of school education: primary education, basic secondary education, and high school education. Primary education (1-4 forms, 6-11 years old); basic secondary education (5-9 forms, 11-15 years old); high school education (10-11 forms, 15-17 years old). This type of education is conducted in different types of educational institutions.

In addition to formal education, there are also many out-of-school instructions and organizations to meet different interest of students:

Additional education; Professional Programs, which are implemented in institutions of primary, secondary, and higher professional education

Primary professional education is conducted in professional educational institutions for special contingencies. It may be based on secondary education or be conducted by inetegrated program of secondary and professional education

Secondary professional education for professional training for certain jobs of students. This education is implemented by a network of *colleges, technicums and schools*. The term of study in educational institutions of secondary professional education is 4 years on the basis of secondary education and 2 years on the basis of high school

Higher education is represented by *academies, universities, institutes, higher colleges*. At the moment there are two systems of higher education are functioning in Kyrgyzstan: traditional 5-year education system and multilevel system, providing three levels of higher education: incomplete higher education, basic higher education (bachelor degree and speciality) and complete higher education (master degree and speciality teaching)

System of adult learning which gains gradual importance recently. The main goal is adaptation of adult population to a new social-economic environment of a newly formed system of adult education

Postgraduate education system (qualification upgrade courses and conversion teaching), which are intended to be life-long education, this system represents a

network of institutions of conversion teaching, different education centers, programs in the leading institutions of the country, and institutes of teaching of specialists of higher qualification through postgraduate teaching and doctorate (Ministry for Education, Science & Culture of the Kyrgyz Republic, 2000).
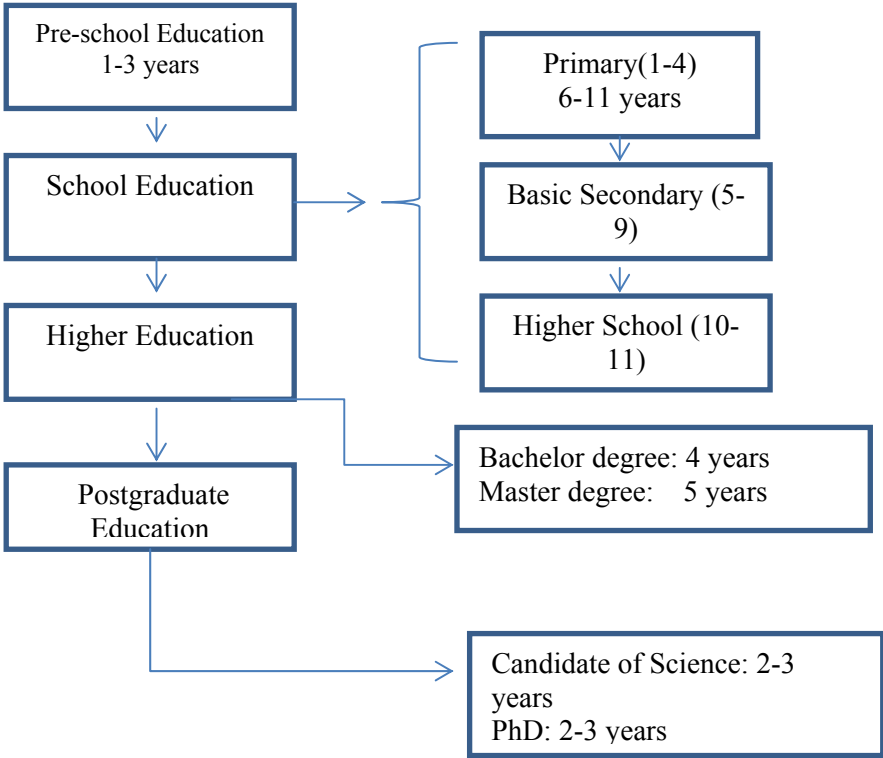
Figure 2.4-1: System of Education in Kyrgyzstan

2.5. ICT and Knowledge Society in Kyrgyzstan

Kyrgyzstan developed a national ICT program in 1995, which included an educational element, but it was only partially implemented because of shortage of funds (Perraton, 2004). In 1996, with funding from the Asian Development Bank mass computerization of schools began. Next three years, the number of computers in schools expanded with donations of foundations and private sector. Ministry of Education and foundation funding took active steps to expand this process in 2000, and provided 1,450 computers. However, the expansion was more rapid between 1996 and 2000 than in the period 2000-2003. "The result of this apparently

piecemeal development is that in middle and senior secondary schools there is now one computer for every 240 students, but that ratio worsens to only 1:971 if you remove from the equation all the outdated, incompatible Soviet-era computers" (Perraton, p.54).

In April 2003 only 21 schools had Internet connection. The low level of Internet use is due to the following reasons: limited telecommunications infrastructure, high cost, staff in schools are not persuaded of its value. In addition, there lack of technical support services, lack of teachers with appropriate speciality, lack of appropriate qualification of teachers, lack of training. In 2002-2003 in 2,029 schools there were only 1345 teachers of informatics. Together with it, there were few teaching materials available in Kyrgyz language. It was concluded, that use of computers in scholls was heavily dependent on external funding like the Soros Foundadion, and the Asia Development Bank, and computers and software in schools were old Soviet computer, which did not meet demands of learners or employers (Perraton, 2004).

In 2002 framework for ICT policy was established by Presidential decree under the title *"Information and Communications Technologies for Development in the Kyrgyz Republic"*, which is also known as the National Strategy (Ure, 2005). Action plan was set to implement ICT strategy development in context of medium-term Comprehensive Development Framework (CDF) till 2010 to achieve goals of the National Poverty Reduction Strategy. ICT development Fund was established with priority given to e-education, e-government, and e-economy. Grand of USD246,800 was provided by the US Trade Development Agency (USTDA) to carry out feasibility study for e-government part of the strategy.

In Action Plan of 2003 details of computer penetration was provided. According to Ministry of Edcuation and Culture data, only 21 schools in Kyrgyz Republic had access to the Internet by the end of 2000, and average number of PCs per school was 2.6, wih only 15 percent of schools having adequate number of computer labs and computers. Furthremore, more than fifty percent of schools had no computer, and only 30 percent of them had telephone connections. Moreover, Action Plan identified

more than ten universities where ICT-related courses run, but most of them were basically in two categories like information (software applications, databases, etc) and informatics (computer science) (Ure, 2005).

Furthermore, another strategic document "Program for Information and Communication Technology Development in Kyrgyz Republic" (Government Decree of 2001, edition of 2006) has objective to facilitate the building of Information Society in Kyrgyz Republic. The main tasks were: integration into world information community, development of democracy, building competitive economy, overcoming the digital disparity, developing legislative basis for information society, development and application of new information and communication technologies (United Nations, 2002).

As the report of Asian Development Bank (2012) shows there is only 3-5% of school internet connectivity in Kyrgyzstan. The target computer-student ratio in Kyrgyzstan for 2008 year was 1:100, and overall computer-student ratio in school system was estimated to be 1:76 in 2010, while raio for modern computer was only 1:240. ICT is still in its infancy in Kyrgyzstan despite the policy about ICT. Moreover, there is no approach for assessment of ICT on student performance and no effective monitoring of ICT use in schools (Asian Development Bank, 2012).

2.6. Higher Education in Kyrgyzstan

According to the report of Ministry of Education of Kyrgyzstan (2009) there are 50 high education institutions (Table 2-4). The number of students in higher education institutions at 2008-2009 years are 243 000.

Table 2-3: Higher Education Institutions

Status of High Education Institution	Number
National	3
Republic	6
Special	9
Regional	7
Between Governmental	3
Others	3
Private	19

The number of higher education institutions has been raised from 1991 four times (from 12 in 1991 to 50 in 2009 year), as it can be seen from Table 2-4. The number of students in high education institutions has also been raised four times (Table 2-5).

Table 2-4: Higher Education Institutions by years

Year	Number of higher education institutions	Number of non governmental institutions	Number of students	Nongovernmental higher education institutions (thousands students)
1991	12	0	58,0	0
2005	51	18	231,1	17,5
2009	50	19	243,0	25,6

Table 2-5: Higher Education institutions by types of Education

	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Total number of educational institutions[a]	49	51	47	49	50
Number of students (persons) of which students of the following departments:	218 273	231 095	236 929	250 460	243 028
• full-time	117 153	123 854	122 510	132 077	129 622
• evening	1 806	1 890	2 052	1 373	1 570
• part-time	99 314	105 351	112 367	117 010	111 836
• of all institutions of higher education:					
private HPE colleges	16	18	15	16	19
Number of students (persons) of which students of the following departments:	15 806	17 476	20 803	24 883	25 625
• full-time	7 933	8 374	10 302	12 342	13 228
• evening	412	382	127	79	0
• part-time	7 461	8 720	10 374	12 462	12 397
• public HPE colleges	33	33	32	33	31
Number of students (persons) of which students of the following departments:	202 467	213 619	216 126	225 577	217 403
• full-time	109 220	115 480	112 208	119 735	116 394
• evening	1 394	1 508	1 925	1 294	1 570
• part-time	91 853	96 631	101 993	104 548	99 439

Note: a. Parent higher professional education (HPE) colleges.
Source: National Statistical Committee (2009)

2.7. Kyrgyzstan-Turkey Manas University

Kyrgyzstan Turkey Manas University was founded in 30 September, 1995 year by the Presidents of Turkey and Kyrgyzstan. There are 8 faculties in university (Faculty of Education, Faculty of Engineering, Faculty of Economic and Administrative Sciences, Faculty of Telecommunications, Faculty of Agriculture, Faculty of Science, Arts Faculty, Veterinary Faculty, and 6 high schools (School of Foreign Languages, Tourism and Hotel, Conservatory, Physical Education and Sports, and Vocational School).

At the beginning of 2013-2014 academic years there were total 4481 students in different faculties and high schools (Manas University, 2013). The total number of instructors was 526 with 133 from Turkey, 245 from Kyrgyzstan, and 4 other countries (Manas University Report, 2011). There are 2 languages of instruction in Manas University: Kyrgyz and Turkish.

2.8. ICT in Education in Kyrgyzstan and Post Soviet Countries

Kyrgyzstan is a former Soviet Country, and has the same system of education as Kazakhstan and Russia. As it can be seen from Table 2-6 Kyrgyzstan has the highest score of young population (33.46) than former Soviet countries Kazakhstan (26.34) and Russian Federation (17.51). The number of Internet Users per 10 000 population is approximately twice higher in Kyrgyzstan (298) than in Kazakhstan (157), while lower than in Russian Federation. However, Kyrgyzstan has the lowest score on Main Phone Lines per 100 populations than Kazakhstan and Russian Federation (Table 2-6).

Table 2-6: Assets Index

County Name	Years of Schooling	Young Population	Newspapers per 1,000 population	Internet Users per 10 000 pop.	Main Phone Lines per 100 pop.	Cell Phones per 100 pop.
Kyrgyzstan	-	33.46	15	298	7.75	1.04
Kazakhstan	11.7	26.34	-	157	13.04	6.43
Russian Federation	-	17.51	105	409	24.22	12.01

Source: United Nations, 2005

Russian Federation has the highest R&D expenditure in comparison with Kyrgyzstan and Kazakhstan. There is no big difference on governments' health expenditure and corruption perceptions, while Kyrgyzstan has the highest score on pupils per teacher ratio (Table 2-7).

Table 2-7: Advancement Index

County Name	R&D Expenditure (% of GDP)	Military Expenditure (% of GDP)	Gov't Health Expenditure (% of tot. gov't exp.)	Pupils per teacher	Corruption Perception
Kyrgyzstan	0.19	0.014	9	24	2.1
Kazakhstan	0.29	0.009	8	19	2.4
Russian Federation	1.00	-	10.7	17	2.7

Source: United Nations, 2005

Table 2-8: Kyrgyzstan Indicators by Educational Level, 2006

	Institutions	Students	Teachers	Students per institution	Student teacher ratio
Pre-school	465	59 156	2 462	127	24
Secondary	2 183	1 098 250	73 620	503	15
Initial vocational	111	29 319	3 281	264	9
Secondary vocational	82	43 413	3 410	529	13
Higher education	49	250 460	14 400	5 111	17

Source: National Statistical Committee (2008).

According to UNDP report, Kyrgyzstan is placed 125 out of 187 countries with 0.622 Human Development Index (UNDP report, 2013). As it can be seen from Table 2-9, Kyrgyzstan is below average HDI of Europe and Central Asia (0.771) and World (0.694).

Table 2-9: Human Development Index of Kyrgyzstan

Year	Kyrgyzstan	Medium human development	Europe and Central Asia	World
2012	0.622	0.640	0.771	0.694
2011	0.621	0.636	0.769	0.692
2010	0.615	0.631	0.766	0.690
2009	0.617	0.624	0.762	0.685
2008	0.616	0.617	0.762	0.683
2007	0.612	0.609	0.757	0.678
2006	0.606	0.599	0.750	0.672
2005	0.601	0.589	0.743	0.666
2000	0.582	0.549	0.709	0.639
1995	n.a.	n.a.	0.684	0.618
1990	0.609	0.481	0.701	0.600
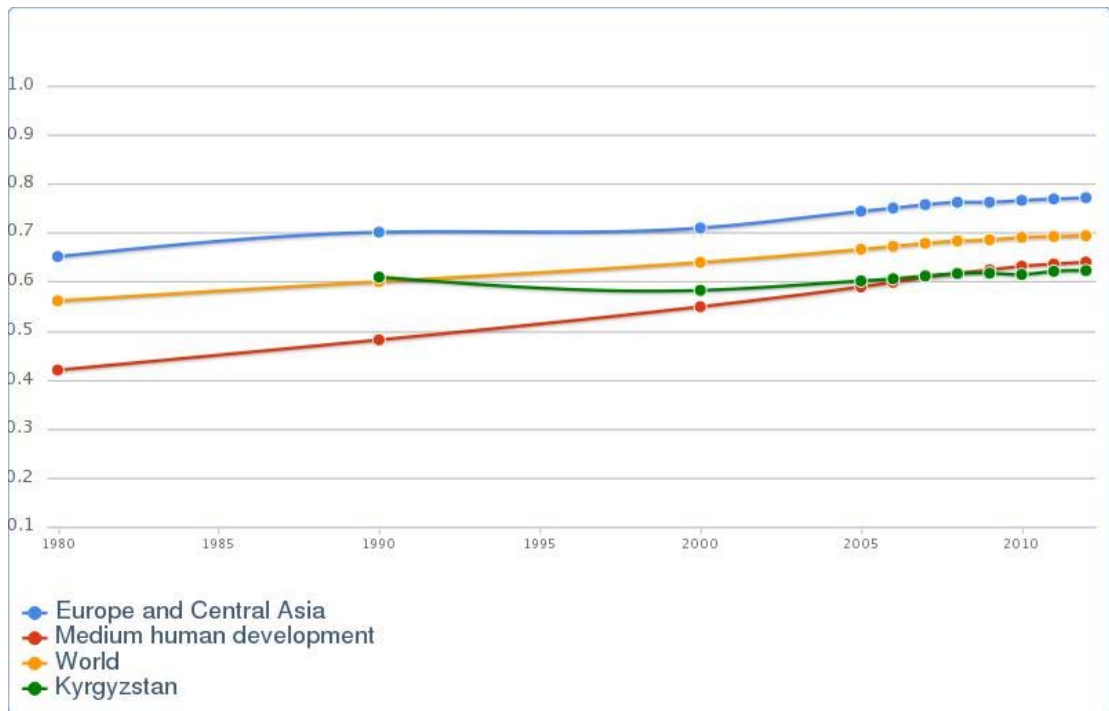
Figure 2.8-1: Human Development Index: Trends 1990 - present

As it can be seen from the Figure1 above, in the years from 1990 to 2000 there was a decrease of HDI in Kyrgyzstan in comparison with World and Europe. Starting from 2000 to 2012 there is a slight increase, but Kyrgyzstan is still below average HDI of Europe and Central Asia and World.

The rankings according to research of Asian Development Bank of 2012 research revealed the variation of school Internet connectivity in Central Asian countries, with only 3%-5% in Kyrgyzstan, 10% in Tajikistan, 60% in Uzbekistan, and 100% in Kazakhstan. Some of the reasons are lack of adequate financial resources in school budgets, and lack of technical access to the Internet. 25-30% of computers supplied to schools in Kyrgyzstan were not operational, which caused difficulty in affording the cost of reliable maintenance services, especially in rural and remote areas. ICT is restricted to the teaching of informatics and computers skills (Asian Development Bank, 2012).

Kyrgyzstan was ranked last in the Program of International Student Assessment (PISA) reports of 2006 and 2009 (Figure 2.2). The Organization of Economic Cooperation and Development (OECD) and the World Bank have conducted a policy review to understand the reason of that performance. They have concluded that there

is lack of time for practical, creative and integrated learning, because of the curriculum overload (Figure 2.3). The system of education in Kyrgyzstan is inherited from Soviet Era, where there is overload of subjects and hours. Another reason is lack of textbooks, most of them are poor designed and outdated. Furthermore, both teachers and students have little access to other teaching materials. Low teacher salaries (60% of the average civil service salary) are barrier to increase performance.

World Bank and OECD (2010) have made the following suggestions to increase students' performance:

1) Modernize the structure and Content of the School Curriculum: As it can be seen from Figure 3, 0% of time is placed for technology. Policy makers should allocate time for Technology, too.

2) Establish Effective Student Assessment Systems: Assessment system is based on reproduction of content instead of measuring how students can analyze, apply, and understand the material.

3) Ensure Equitable Access and Success for All: After basic school about 30000 young people drop-out of school, and have inadequate skills for labor market. Training should be developed for that people to be able continue in labor market.

4) Reform Vocational Education and Training: Population at the age group of 15-20 is unemployed. Some guidance and career information should be provided; vocational education should be reviewed to build job relevant skills.

5) Enhance policies, Incentives, and Opportunities for Teacher Management and Development: Comprehensive, coordinated teacher policy should be developed for the teaching profession. The teaching force should be smaller but better paid.

6) Raise the Quality and Relevance of Higher Education: Higher education in Kyrgyzstan should be modernized to increase the quality of higher education.
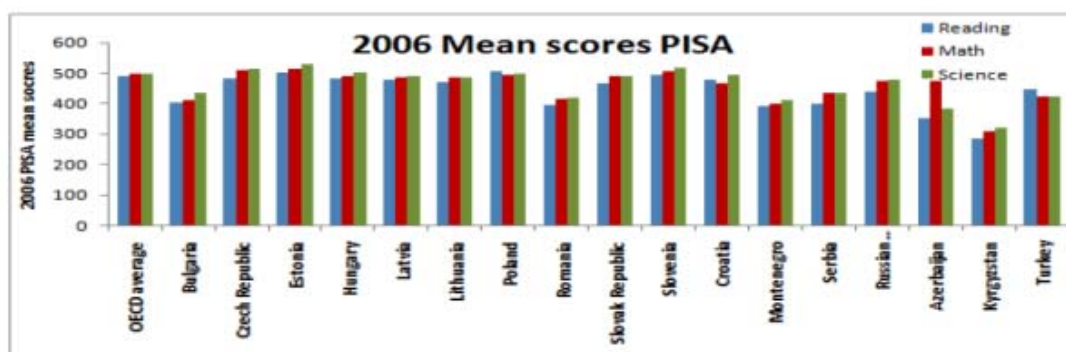
Figure 2.8-2: Mean Scores PISA 2006

Source: OECD PISA result 2006
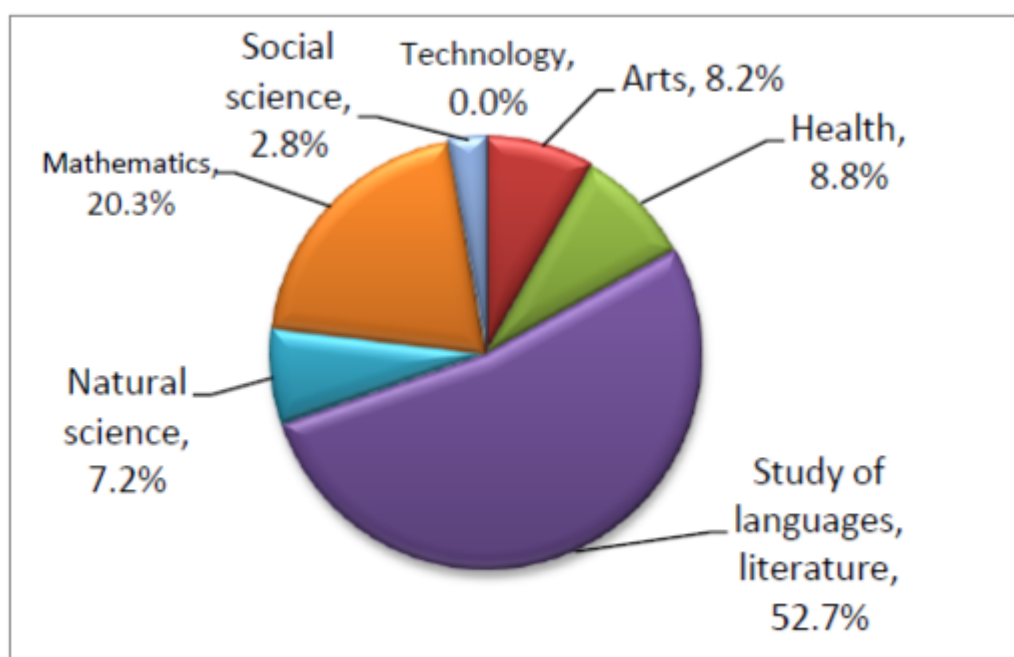
Figure 2.8-3: Distribution of Subjects in Curriculum in Kyrgyzstan

Source: OECD PISA result 2006

According to the Ministry of Education Main teaching plan for grades 5-9, Kyrgyz Language of Instruction for 2006-2007 years in the subject list ICT course is only 1 hour/week for grades 7, and 2 hours/week for grades 8 and 9, while there is no ICT course for grade 10 and grade 11.

Teachers should be trained to integrate ICT into their repertoire of teaching skills. They have to be competent in the use of ICT equipment. Furthermore, teacher training should be provided. According to the research currently in rural areas of

Kyrgyzstan there is lack of computers and access to internet. There is only 1 computer per 38 students in one of the better resources public Higher Education Institutions (Education reform in a Kyrgyz Republic, 2010).

A study was conducted by Akin (2013) on computer and internet usage in higher education in Kyrgyz University. 36 University students participated in the study. The results of the Survey study reveal that 53% of students do not have personal computer at home. 74% of students who don't have computer stated that it is too expensive. 74% of students having computer at home do not have internet connection, and 62% of them stated that cost of internet is too expensive.

A study on the use of ICT was conducted in Russia by Porshnev &Giest (2012). 825 students of 18 Russian leading universities were the sample of the study. The main questions were about using internet for different purposes, such as searching on the internet, playing games online. The main purpose of the paper was to explore how students use of ICT in learning and everyday life. The participators answered online survey monkey questionnaire.

Results of the study indicate that 57% of students use internet every day, while 87 % use every week. Furthermore, there was a difference between gender in using internet every day. More males use internet than females. Majority of students in all universities noticed availability of materials in an electronic form. There was no significant difference between universities on availability of electronic materials, but students from IT faculties provide more information in electronic form than students on non IT faculties. Results of the study shows that students positively refer to ICT use, they like to have access to information, and do not feel overloaded by different sources.

2.9. Summary and Gap in the Literature

ICT plays an important role in transition from Information to Knowledge Society. As it was shown from Asset Index Kyrgyzstan is a developing country, and in order to transform to Knowledge Society there is still much to be done. Furthermore, as literature review above shows there are only few studies conducted

about use of ICT in higher education. The number of computers in schools is still low, and number of computer and Internet users in Kyrgyzstan is also low.

While literature above shows the number of studies on use of ICT and possible barriers, there is no evidence, no research study conducted yet to show the current situation of ICT in universities in Kyrgyzstan. There is a gap in the literature on use of ICT, while it has has a great potential to enhance teaching, and learning if used appropriately (Cuban, 2001). Meanwhile, according to the studies mentioned above there are a number of barriers that prevent effective integration of technology into instruction, such as lack of time, lack of equipment, lack of training.

CHAPTER 3

METHODOLOGY

Procedures used in this study are presented in this chapter, which includes purpose and research questions, design of the study, participants of the study, instruments of the study, data collection methods, data analysis, threats to study, and summary of the chapter.

3.1. Purpose and Research Questions

The purpose of this study was to investigate the barriers and enablers of technology integration into instruction in the Kyrgyzstan-Turkey Manas University by collecting data from both students, and instructors of the university. Additionally, interviews were arranged with students and instructors in order to identify in-depth reasons of the specified barriers and find the ways to deal with those barriers.

The main research questions of this study are presented below:

1 What are the barriers of technology integration into instruction in Manas University?

    1.1 What are instructors' perceptions of barriers of technology integration into instruction in Manas University?

    1.2 What are students' perceptions of barriers of technology integration into instruction in Manas University?

2 What are the enablers of technology integration into instruction in Manas University?

    2.1 What are the enablers of technology integration into instruction in Manas University according to instructors?

    2.2 What are the enablers of technology integration into instruction in Manas University according to students?

3   What are the perceived ICT and Computer competencies of instructors and students?

4   To what extent instructors and students use ICT during education?

    4.1 What is the level of ICT use of instructors?

    4.2 What are the students' perceptions about ICT use in Manas University?

    4.3 What are the expected ICT uses during instruction according to students?

3.2. Design of the Study

Mixed methods research design approach was used as a design for this study in order to answer the specified research questions. Mixed methods approach was defined by Creswell (2003) as a type of research design where investigator collects and analyzes data, integrate the findings, and draws references in a single study by using both quantitative and qualitative approaches (Tashakkori & Teddlier, 2009). Mixed methods research was selected in order to gather more detailed information using both quantitative and qualitative data collection techniques to present more complementary data on the topic under research.

Specifically, this study followed sequential explanatory design where quantitative data were collected first, and qualitative data collected after it, in order to help to explain the results of the quantitative data (Figure 3-1). Sequential explanatory design consists of two separate phases: quantitative data collectiong and analysis followed by qualitative data collection and analysis (Creswell, 2003). Quantitative data were collected and analyzed following by preparation of qualitative interview guideline on the basis of results of quantitative data. Then, qualitative interviews were conducted, and data analyzed to help explain quantitative results.

```
┌─────────────────────────┐
│    Quantitative data    │
│       collection        │
└─────────────────────────┘
             │
             ▼
┌─────────────────────────┐
│ Quantitative Data Analysis │
└─────────────────────────┘
             │
             ▼
┌─────────────────────────┐
│    Interview Guideline  │
└─────────────────────────┘
             │
             ▼
┌─────────────────────────┐
│ Qualitative data collection │
│        (Interviews)     │
└─────────────────────────┘
             │
             ▼
┌─────────────────────────┐
│  Qualitative Data Analysis │
└─────────────────────────┘
             │
             ▼
┌─────────────────────────┐
│      Interpretations    │
└─────────────────────────┘
```
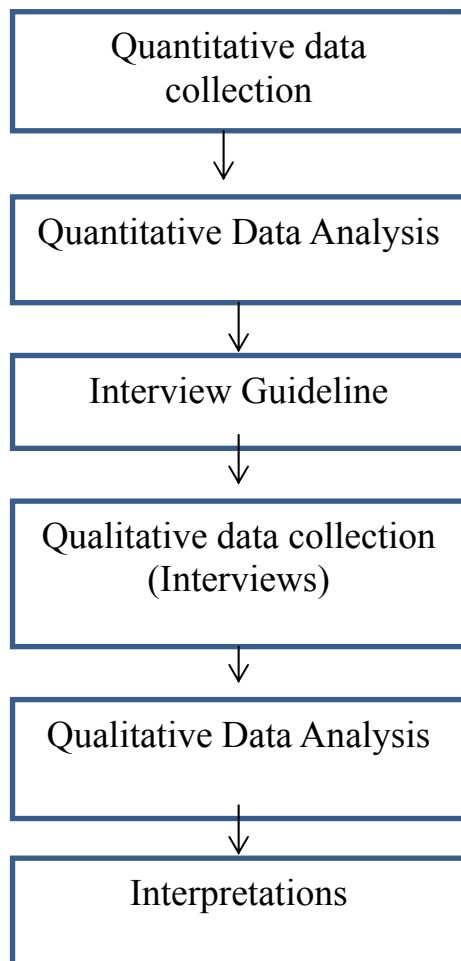
Figure 3.2-1: Sequential Explanatory Design

3.3. Participant of the Study

Pilot Study Participants

Pilot study was conducted prior to collecting real data to check content validity of instruments. Data were collected from 61 undergraduate students from Engineering Department (30 males and 31 females), and 11 instructors (6 males, and 5 females) in the spring semester of 2009-2010.

Main Study

Study was divided into two phases: Phase 1 - quantitative data collection phase, and Phase 2-qualitative data collection phase

Phase 1

For quantitative data collection phase 477 Students (208 males and 269 females), and 57 instructors (35 males and 22 females) participated (Table 3-1). For students, random sampling technique was used representing each faculty. Questionnaires for instructors were also distributed using random sampling (Table 3-2).

Table 3-1: Descriptive Information of Participants

	Frequency	%	Total
Students			**477**
Male	267	43.6%	
Female	208	56.4%	
Instructors			**57**
Male	22	61.4	
Female	35	38.6	

Table 3-2: Distribution of Instructors according to Faculties

Faculty	Frequency	%
Engineering	11	19.3
Education	5	8.8
Science	5	8.8
Communication	16	28.1
Economics	20	35.1
Total	**57**	

Phase 2

In Phase 2 - Qualitative data collection:

- 9 Instructors using purposeful sampling technique, based on criteria of having at least 3 years of teaching experience
- 11 students using purposeful sampling technique, based on criteria to be at least a 4th year student or MS student, who was previously undergraduate student at Manas University

Both instructors and students were selected using purposeful sampling to provide more in-depth information about the topic of research

3.4. Data Collection and Instruments

This study used mixed-method sequential explanatory design where both quantitative and qualitative research approaches were used. Data collection process of the study and the instruments that utilized in this process can be summarized as the following:

Quantitative Data Collection

For quantitative data collection, 2 different questionnaires were distributed to instructors and students of Kyrgyzstan- Turkey Manas University. Instructors and students were selected by using random sampling technique, representing each faculty. Quantitative data were collected from both instructors and students at the beginning of Fall semester 2010-2011. Questionnaire for instructors were distributed to instructors at their office, and was received back one week later. Questionnaire for students were distributed to students at the beginning of the lecture. Permission from instructors was taken, and 20 minutes were given for students to fill up questionnaires. Questionnaires for both students and instructors were in Turkish language, and translated to Russian language by the researcher. Questionnaires were translated to Russian language because it is the 2nd official language in Kyrgyzstan. Researcher is fluent in both Turkish and Russian language, but to check the correction of translations after questionnaires were translated, they were checked by the linguistic expert, and necessary corrections were made.

Both students and instructors had an option to choose the language of Questionnaire: Turkish or Russian. Not all of the instructors are fluent in Turkish language, so they filled up questionnaire in Russian language. However, all of students are expected to be fluent in Turkish language, because all students who did not know Turkish had attended one year language preparation school.

Questionnaire for instructors was completely adapted from Yuksel Goktas (2006) study. The questionnaire consists of total 12 sections and includes demographic data questions, 7 five point Likert type items, 13 multiple choice items, and 4 open-ended questions. Items grouped around following major topics: 1) Personal information, 2) ICT usage during instruction, 3) Barriers of technology

37

integration in university, 4) Possible enablers of technology integration, 5) Competency in using ICT.

Questionnaires were distributed to collect data related to the possible enablers, and barriers of technology integration in university (Appendix A). The questionnaire consist of the following items: demographic information, Likert type questions related to the degree of using technology during instruction; competency in using technology; attitudes towards possible barriers and perceptions towards better integrating technology.

Pilot test was conducted with 11 instructors from different faculties of Kyrgyzstan-Turkey Manas University. Cronbach alpha were calculated 0.78 denoting satisfactory reliability. After data were collected Cronbach alpha was recalculated, and the range Cronbach alpha were 0.85 denoting satisfactory reliability (Table 3-3).

Table 3-3: Instructors Questionnaires Reliability

	N	Pilot Study	Main Study
Technology Usage Scale	9	.73	.80
ICT perceptions	18	.87	.90
Use of Technology Scale	18	.74	.90
Barriers of Technology Integration scale	11	.90	.84
Technology Integration Scale	9	.67	.88
Factors Effecting Technology Competency scale	9	.68	.69
ICT Competencies Scale	21	.90	.96
Total		.78	.85

Questionnaire for students was parcially adapted from the questionnaire developed by Hasan Tinmaz (2004) and questionnaire developed by Aysegul Kara.

The questionnaire consist of the following items: demographic information, Likert type questions related to the degree of using technology during instruction; competency in using technology; attitudes towards possible barriers, and perceptions towards better integrating technology (Appendix B).

Pilot test was conducted with 61 students from different faculties of Kyrgyzstan-Turkey Manas University. Internal consistency for students scales after pilot study were 0.84 denoting a satisfactory reliability, and after collecting maing data 0.85 respectfully (Table 3-4)

Table 3-4: Students Questionnaires Reliability

	N	Pilot Study	Main Study
Computer Competency Scale	6	.85	.83
Effect of technology	8	.83	.88
Enablers of technology	13	.84	.85
Total		.84	.85

Qualitative Data Collection

For the qualitative part of data collection, two different interview guides were prepared by researcher for students and instructors. Semi structured interviews were used to collect data from both instructors and students. Interviews were developed according to quantitative questionnaire results. Four experts examined each interview guide, and on the basis of feedback received questions were revised.

Interview guide for instructors and students includes focus on the following topics: 1. Personal Information. 2. ICT usage during instruction. 3. Barriers. 4. Enablers.

Interviews with instructors and students were arranged after collecting and analyzing quantitative data. Instructors were selected by a convenience sampling method from different departments using the following criteria: at least 3 years of teaching experience. Students were selected by using purposeful sampling method on the criteria to be a 4th year student.

Qualitative interviews were collected from both students and instructors in the middle of Fall semester of 2011-2012 by researcher. All interviews for both instructors and students were collected in classroom at previously specified time. It was assumed, that there were no difference in terms of students and instructors perpections during 1 year period from quantitative data collection in 2010-2011 till conducting interviews in 2011-2012.

Interviews for both students and instructors were prepared in Turkish language, and translated to Russian language by the researcher. After interview guides were revised by experts, they were checked by the linguistic expert for the clarity of questions, and necessary corrections were made. Both students and instructors had a change to choose the language of Interview: Turkish or Russian.

3.5. Reliability and Validity of Instruments

The adapted instruments were checked for validity and reliability issues. In order to check it, instruments were reviewed by 3 experts and 4 peers to check construct validity of the instruments, and revised according to their suggestions. The developed questionnaires for instructors and students were prepared in Turkish language, and later translated to Russian language by the researcher. Instruments were also checked by linguistic expert and revised and corrected where necessary. Both students and instructors had chance to choose language: Turkish or Russian. Furthermore, to check content validity of the instruments pilot study were conducted with sample of 61 students and 11 instructors of Manas University.

Qualitative interview guides for students and instructors were also prepared in Turkish language. Interview guides prepared in Turkish language was reviewed by 4 experts in order to check content validity, and revised according to the feedback received. After it, interview guide was translated by the researcher to Russian language. Students and instructors had opportunity to choose the language: before conducting interview they were asked on which language they wish to have an interview, Turkish or Russian.

To check inter-coder reliability of interview guide, peer who is fluent in both Turkish and Russian were asked to code two interviews one in Turkish, and one in

Russian. Inter-coder reliability was calculated using Miles and Huberman (1994) formula, and agreement score for Turkish interview was 0.82, and for Russian interview was 0.79.

3.6. Ethical issues

Before collecting data from students and instructors, permission from Kyrgyzstan Turkey Manas University administration was obtained in order to show that collected data and used methods will not harm participators. Furthermore, researcher applied for the Research Center of Applied Ethics with providing all questionnaires, and interview guides. Written permissions were obtained to collect data. At the beginning of qualitative interview collection, permission from instructors and students was obtained to tape interviews.

3.7. Data Analysis

Quantitative and qualitative data analysis methods were used in this study. In order to analyze quantitative part of the study all questionnaires collected from students and instructors were analyzed using SPSS 16.0 version program. Descriptive statistics were utilized to describe what the data collected from the samples shows.

Qualitative interviews were analyzed using Content Analysis proposed by Miles and Huberman (1994). Interviews were tape recorded, and transcribed by the researcher after it. Coding categories was identified after reading, and all interviews was coded accordingly with defined categories (Table 3-5)

Table 3-5: Coding Categories and Themes of Instructors Interviews

Instructors Categories and Themes	Students Categories and Themes
Technology use	Technology use
Possible barriers	Possible barriers
Reasons/ solutions	Reasons/ solutions
Enablers	Enablers
Motivation/ Encouragement	Expectations
Positive Effect of Technology	Positive Effect of Technology
Negative Effect of Technology	Negative Effect of Technology
Technological base	Technological base
Effective use of technology	Effective use of technology

3.8 Limitations of the Study

1) Questionnnaries were collected in 2010-2011 and interviews were collected one year later in 2011-2012. It is assumed that there was no change in terms of students and instructors perceptions during 1 year period.

2) Questionnarie and interviews were conducted in both Turkish and Russian Language. It is assumed that respondents were fluent in Turkish and Russian languages.

3) Questionnaires and interviews were the main data collection methods. Location threat during questionnaires collection from students was not possible threat to study because questionnaires were collected during specified time and place, and in one location (classroom). But it was possible during collecting questionnaires from instructors because instructors might have had different locations during completing the questionnaire. Furthermore, location threat was possible during the interviews, and it was quite impossible to conduct all interviews with instructors at one scheduled

time and place, and one classroom; interviews were conducted individually, to collect more accurate data from each instructor. That is why, location threat can occur, and to eliminate the effects of this threat, interviews were held at one place, at previously scheduled times with each instructor.

4) Authentication threat was possible while collecting the data from students and instructors because we cannot be sure that the data gathered represent the real truth, and control this type of threat is very difficult. So, this threat cannot be controlled, and the data will reflect directly and interpreted according to the information gathered from students and instructors.

5) This is a mixed method study and contains quantitative as well as qualitative data collection methods. The results of the interview which is a part of the qualitative study can be interpreted by the researcher differently if it is done at different time. So, to control the instrumentation threat, the data was controlled and interpreted at scheduled time to reduce the effects of instrument decay. To control data collector characteristics while interviewing one researcher gathered all data, and communicated with each instructor in the same manner.

3.9 Assumptions of the Study

1) The participants of this study are believed to have responded accurately and truthfully to all the measures used in the study.

2) The collected data were accurately recorded and analyzed.

3) Reliability and validity of all the measures used in the study were accurate enough to interpret the results.

CHAPTER 4

RESULTS

This chapter presents result of the study concerning the research questions. Firstly, general and demographic information of participants is presented, and then research questions are answered in the order they were asked in methods section.

4.1. Demographic information of Instructors

57 instructors with 35 males and 22 females participated in this study (Table 4-1). Most of the participants were research assistants (29.8%), Dr. Instructors (17.5%), Associate Professors (14%), and instructors (14). Majority of the instructors were from the Faculty of Economics (35.1%), Communication (28.1%), and Engineering (19.3%). 42.1% of instructors stated that they took in-service training on ICT usage, 57.9% did not received any training. 84.2% responded that they have office computers, and 100% of those have Internet access. While 87.7% have computer at home, only 59.6% of them have an internet access, while 40.4% of the instructors don't have internet access at home (Table 4-1).

Table 4-1: Demographics of Instructors

Academic title	Frequency	%
Lecturer	3	5.3
Res assistant	17	29.8
Instructor	8	14.0
Dr. instructor	10	17.5
Assist. Prof.	6	10.5
Assoc. Prof.	8	14.0
Prof.	4	7.0
Academic	1	1.8
Faculty		
Engineering	11	19.3
Education	5	8.8
Science	5	8.8
Communication	16	28.1
Economic	20	35.1
In-service training about ICT		
Have in-service training	24	42.1
No in-service training	33	57.9

In Table 4-2 profile of instructors who participated in the interviews are presented. Purposeful sampling technique was used based on criteria at least 3 years of teaching experience. As it can be seen from Table 4-2 teaching experience ranges from 4 to 32 years.

Table 4-2: Profile of Instructors as Interview Participants

N	Pseudonyms	Gender	Academic Title	Experience
1	Alina	F	Assoc. Prof.	28
2	Jyldyz	F	Dr. Instruct	4
3	Aybek	M	Assist Prof.	6
4	Mayram	F	Assist Prof.	5
5	Asel	F	Instructor	17
6	Usen	M	Instructor	10
7	Murat	M	Assoc Prof.	32
8	Marat	M	Assoc Prof.	29
9	Rahat	F	Assist Prof.	14

4.2. Demographics of Students

In total 477 students with 43.6% males and 56.4% females participated to the study. Results indicate that the majority of the students were from the department of Economics 42.6%, Communication 27.7%, Engineering 11.5%, Science 10.5%, and Education 7.8%. 42.8% of students have a personal computer at home; however 57.2% do not have one. As it is shown in Figure 5 65.7% of students having computer at home have an internet access, and 34.3% do not have internet access at home (Table 4-3).

Table 4-3: Demographics of Students

Gender	Frequency	%
Males	208	43.6
Females	269	56.4
Faculty		
Engineering	55	11.5
Education	37	7.8
Science	50	10.5
Communication	132	27.7
Economics	203	42.6
Home Computer		
Have computer	204	42.8
Do not have computer	273	57.2
With internet access	134	65.7
Without internet access	70	34.3

Table 4-4 shows gender information of students by faculties. As it can be seen from Table 4-4 there were 60% of males and 40% of females participated from the department of Engineering, 29.7% of males and 70.3% of females from the department of Education, 40% of males and 60% of females from the department of Science, 46.2% of males and 53.8% of females from the department of Communication, 41.4% of males and 58.6% of females participated from the department of Communication.

Table 4-4: Distribution of Students by Gender and Faculty

Faculty	Frequency	%
Engineering		
male	33	60
female	22	40
Total	55	100
Education		
male	11	29.7
female	26	70.3
Total	37	100
Science		
male	20	40
female	30	60
Total	50	100
Communication		
male	61	46.2
female	71	53.8
Total	132	100
Economics		
male	84	41.4
female	119	58.6
Total	203	100

As it is shown in Table 4-5, 50.9% of students were second year, 21.6% were fourth year, 18.4% were third year, and 8.6% were first year students.

Table 4-5: Distribution of Students by Year

Year	Frequency	%
1	41	8.6
2	243	50.9
3	88	18.4
4	103	21.6
Total	477	100.0

The profiles of students participated in qualitative part of data collection is presented in Table 4-6. As it can be seen below, all of the selected students were at least 4th year or higher.

Table 4-6: Profile of students as interview participants

N	Pseudonyms	Gender	Department	Year
1	Asel	F	Management	4
2	Aybek	M	Management	4
3	Aynura	F	Economics	4
3	Murat	M	Finance	4
4	Ayday	F	Economics	4
5	Meerim	F	Computer Engineering	4
6	Aygul	F	Computer Engineering	MS
7	Gulnura	F	Turkology	4
8	Rahat	F	History	MS
9	Usen	M	Radio TV	4
10	Nazgul	F	Communications/	4
11	Aybek	M	Communications	4

4.3. Barriers of technology integration into instruction in Manas University according to instructors (Research question 1)

The first research question in this study was about the barriers of technology integration into instruction according to instructors and students. The data for both instructors and students was collected through the questionnaire and interviews.

4.3.1. Instructors' perceptions regarding the barriers preventing use of technology during instruction

Table 4-7 presents the results on barriers of technology integration according to instructors. Instructors perceived the most significant barrier in integrating ICT into instruction as "Lack of in-service training about ICT" (M = 3.47), "Inadequate repertoire of knowledge and skills on the integration of ICT into instruction" (M= 3.42), "Lack of basic knowledge and skills about ICT" (M= 3.39), "Lack of computer access for students' out of class" (M=3.32), "Lack of technical support" (M=3.25), "Lack of appropriate software" (M=3.21), and "Lack of materials for instruction" (M=3.18).

Table 4-7: Barriers of technology integration according to instructors

Barriers	M	SD
Lack of in-service training about ICT	3.47	.97
Inadequate repertoire of knowledge and skills on the integration of ICT into instruction	3.42	.90
Lack of basic knowledge and skills about ICT	3.39	1.01
Lack of computer access for students out of class	3.32	1.04
Lack of technical support	3.25	.97
Lack of appropriate software	3.21	1.08
Lack of materials for instruction	3.18	1.02
Lack of physical environment for integrating ICT in classroom	3.11	.99
Lack of hardware (computer, printer etc.)	3.07	1.19
Inappropriate course content	2.88	.87
Lack of time for integrating ICT in classroom	2.70	.91
Overall mean	3.18	

Results of questionnaires are supported by interview results:

Table 4-8: Major findings on barriers

Barriers	*f*
Lack of in-service training about ICT	7
Lack of hardware	5
Lack of time for integration ICT in classroom	2
Lack of materials for instruction	2
Lack of technical support	3
Cost of computers	1
Lack of knowledge and skills of faculty members about ICT	1

- **Lack of hardware**

According to questionnaire results "Lack of hardware" (M=3.07) was reported as a barrier, but it is below the overall mean (M=3.18) of barriers. However, as results of qualitative interviews show four instructors stated that there is a lack of computer laboratories for students. Instructor (Alina) from Science faculty commented that "If we count all computers it will be approximately 5 computers per student, but not that exact, because we count instructors' computers which are not available to students. There is no computer laboratory in our faculty" (See Appendix E.1).

Furthremore, three instructors mentioned that there is a lack of projectors. Instructor (Rahat) from Science faculty indicated: "It is better than in other universities, but there is a lack of projectors. For one faculty there is only 1 projector available, it is too less" (See Appendix E.2)

In addition, another instructor (Jyldyz) stated that there is a lack of printers, and photocopy machines in the faculty. In one building there is only one photocopy machine, and because of it they are often out of order. She proposed solution: "Photocopy machine should be in each faculty and for example on topics like for printers to be repaired on time having a technical support is very important" (See Appendix E.3)

As qualitative interview results indicate there is lack of hardware such as lack of computer laboratories for students, lack of projectors, lack of printers, and lack of photocopy machines in university.

- **Lack of in-service training about ICT**

According to questionnaire results "Lack of in-service training about ICT" (M=3.47) was reported by instructors as the main barrier with the highest mean score. The results of qualitative interviews are in line with questionnnarie results, seven instructors mentioned about lack of training in university.

One of the instructors (Asel) stated: "You see, I have to know more than students, but for this, there should be training with us, instructors. But here the situation is vice versa, student knows more than instructor, I'm asking questions to students: 'How should I do here, guys? I should open that, right?' You see, it's not good, not comfortable; I even have a complex because of this (See Appendix E.4).

Another one (Mayram) mentioned: "There is no in-service training, what should I say, everyone has to learn on his own and ask a friend: Do you know, can you help me" (See Appendix E.5).

Most of instructors complained about lack of training, and stated that they want to attend training, and expect university to provide such training.

- **Lack of time for integrating ICT in classroom**

As questionnaire results indicate "Lack of time for integrating ICT in classroom" (M=2.70) has the lowest mean score between barriers. Two instructors mentioned about this barrier in qualitative interviews. One of the instructors stated: "For example here the main problem is the absence of ready classrooms to use ICT. We have to prepare the classroom before the lecture has started, then collect and give back"… "That is why there is a problem with installing and collecting back, it takes time. There is lack of technical personnel for this purpose, for example, instructors stay on their own" (See Appendix E.6). As another instructor stated, the reason of it is the case of stolen projectors. She mentioned that there was a case when projector installed in the classroom was stolen, and after that case in order to avoid it instructors have to ask for projectors, install and give back to responsible employers.

- **Lack of materials for instruction**

The mean score of Lack of materials for instruction (M=3.18) is the same as overall mean for barriers. Two instructors during interviews mentioned about lack of materials for instruction in Kyrgyz language. One of the instructors' states: "Kyrgyz language is not developed not only in the area of computer technologies but generally, there is lack of literature in Kyrgyz language. Even in the supermarkets people do not speak Kyrgyz, but here we are expecting people to learn computer technologies in Kyrgyz language. There is no literature in Kyrgyz, that's why students become more narrow-minded. They have to get the literature a bit there, and a bit somewhere else, but it is still not enough. But students suffer; they listen on Kyrgyz language, then come and read in Russian, then in Kyrgyz, and in Turkish. People here forget Kyrgyz language they speak Turkish" (See Appendix E.7). Instructor complained about lack of resources in Kygyz language, and noted that due to the multilanguages students become 'narrow-minded'.

- **Lack of financial support by university to invite specialists who use technology very well and can teach others**

Regarding the barriers of technology integration there are a lot of mentioned above problems and overall instructors want to use ICT effectively but cannot due to the mentioned above barriers. In addition to questionnaire the following barriers was indicated during interviews with instructors: "Lack of financial support of university to invite specialists who use technology very well and can teach others", and "Speed of the internet in the summer".

Two instructors mentioned about lack of financial support of university to invite specialists who use technology very well and can teach others. One of instructors proposed to invite specialist from other universities, another instructor asked to invite more experienced instructors from Turkey, because their teaching methods are modern and completely different from Kyrgyz instructors teaching methods.

- **Speed of internet in summer**

Another barrier is the speed of the internet in summer. One of instructors noted: "In summer the speed of the internet is becoming lower which decrease the

performance. We are trying to prepare the lectures for the fall semester during the summer, but due to the low speed of the internet we spend more time to search and download some information. Moreover, there is a limitation to view videos. There should be no limits for instructors and the speed of the internet should be higher. However, this limit can be applied for administrative, but not academic stuff" (See Appendix E.8). So, this is another barrier for technology integration into education.

In addition to mentioned above barriers, interesting result is that three of instructors stated that comparing to other universities in Kyrgyzstan the situation in terms of technology infrastructure is much better in Manas University. As instructor (Mayram) indicated: "However, if compare with universities in Turkey than we can see that situation here is worse, like a number of projectors, the number of equipped classrooms etc."

4.3.2.   Barriers of technology integration according to students

Students marked as checked a list with statements on barriers of technology integration. According to students the most important barrier of technology integration into education is that it is too expensive (41.7%). Also, 41.3% of students think that they do not have technical support they need, which is another important barrier. 37.1% of the students stated that they experience a problem while connecting to the internet. Students reported that they do not have enough technical abilities to use computers (35.8 %). 31.7% of the students stated that they experienced problems while connecting to the internet and the same percent of students think that they do not have enough access to computers as a barrier of technology integration (Table 4-8).

Furthermore, they feel they have extra responsibilities while using computers that are not related to the courses (28.7%). 15.9 % of the students state that some software programs do not work on their computers. However, 23.1% of the students state that there is no barrier at all.

55

Table 4-9: Barriers of technology integration into instruction according to students

Barriers	Frequency	Percent
Computers are too expensive	199	41.7%
Do not have technical support they need	197	41.3%
Experiencing problems connecting to internet	177	37.1%
Don't have enough technical ability to use computers	171	35.8%
Experiencing problems while connecting to the internet	151	31.7%
Do not have enough access to computers	151	31.7%
Feel extra responsibility to use computers	137	28.7%
No barrier	110	23.1%
Applications don't work on computer	76	15.9%

According to the results of interviews with students the major barriers in addition to the questionnaire are:

- **Lack of hardware**

In addition to university instructors, one of students stated that there is a lack of photocopy machines, and printers. She complains that there is only 1 photocopy machine in one big university. Since of lack of it, students have to go outside to copy materials, and it takes their time.

- **Lack of knowledge and skills of faculty members about ICT**

One of students complained about instructors skills regarding use of ICT, he stated: "If instructors would learn Excel better it would be much easier for us, that is more deeply, they just don't want to learn. Instructors would like to explain, but most of them, I don't know, don't have personal computer, did not have and they did not see. They just miss it, just say: - Yes, you can count it in Excel, but we would like that they show us how to do it. I think that our distance to computer, no generally computers, if any subject would be taught in laboratory, it would be good. They show on projector, but we don't have lectures just read and that's all. They could at least provide us with computer class, from that time until that time, but we don't have it." (See Appendix E.9)

- **Resistance of elderly instructors to learn how to use ICT**

As student (Aynura) stated that young instructors know better how to use ICT while elderly instructors from Soviet period don't know, they don't want to learn.

She stated that elderly instructors don't now how to integrate technology during instruction: "Young instructors know better than those from Soviet period, I can say that they don't know at all". In addition, one instructor also mentioned about inactivity and resistance of elderly instructors to integrate technology during instruction.

- **Lack of technical support**

According to questionnaire results 41.3% of students mentioned that they "Do not have technical support they need". In addition, according to qualitative interview results two students and one instructor stated that instructors have to learn on their own how to use ICT, and there is a lack of technical support. One student mentioned: "There is a lack of technical support; instructors have to learn on their own.There are courses opened for old instructors but old instructors do not attend".

- **Technological infrastructure is enough, and better than in other universities in Kyrgyzstan**

Both six students and three instructors mentioned that situation regarding technical infrastructure is enough and better in Manas University in comparison with other universities in Kyrgyzstan:

Student (Gulnura) stated: "I think that technological infrastructure is enough here in comparison with other universities. There no such conditions: we have internet, laboratories, can use if free of charge" (Appendix E.10)

Another student indicated: "Well, in comparison with other universities, here is it enough. Everything is provided, you only have to study. In dormitory there is an internet room, cinema room, we only have to study" (Appendix E.11)

Furthermore, the report of Manas University of 2013 shows that the number of computer laboratories has been increased from 6 in 2005-2009 to 28 in 2010-2013 (Manas University report, 2013). Moreover, as it is shown in Table 4-10, investments on laboratories have been increased: In 1995-2004 years it was 558 088.00 $ (American USD), in 2005-2009 – 632 953.00 $ (American USD), and 2 113 214.00 in 2010-2013 years.

Table 4-10: Expenditure on Laboratories and other equipment

Investment (USD)	1995-2004	2005-2009	2010-2012	Total
Buildings	26 588 569,00	9091.425,73	25 085,45	60 765 610,18
Equipment for Laboratories	558 088,00	632 953,00	2 133 214,00	3 304 255,00
Other equipment	1 690 097,00	2 262 445,00	2 251 495,00	6 204 037,00
Total	2 248 185,00	2 895 398,00	4 364 709,00	9 508 292,00

Adapted from Manas University report (2013)

- **Do not have enough access to computers**

As questionnaire results show 31.7% of students stated that "Do not have enough acces to computers" is barrier to technology integration. In addition the results of qualitative interviews indicate that lack of access to computers is a barrier.

One of the students stated: "Well, in comparison with other universities I think that we have the best technological base in Kyrgyzstan, because projectors and notebooks are used here, but in many other universities they are not used. They only write their lectures on the board. But here more or less is better. But I wish that it will be better, because I see as it is in foreign countries like Turkey, they use more other technologies, labs where enough computers. But here for example, there is a lack of computers when we are in laboratory" (See Appendix E.12)

Another student indicated: "We don't have laboratories, if it was stated here you have laboratory you can use it from that time until that time, if it were systematized. If you don't have a notebook it your problem, you don't have opportunity to use labs, and nothing" (See Appendix E.13).

Furthermore, student from Computer Engineering department complains about lack of access to computer laboratories out of class. She stated that she has her own laptop, however there are some students who don't have, and they experiencing problems because in computer laboratories lectures are studied during the day, and they are closed after 17.00 (See Appendix E.14).

- **Lack of special computer laboratories for Computer engineering department**

One instructor and student from Computer engineering department complained about lack of special computer laboratories in Computer Engineering department. They stated that Communications department has their own special laboratories in the faculty, however there is no special laboratory in Computer Engineering department to teach some special courses. Student provides a solution that university management should solve problem by opening special laboratories as communications faculty have.

4.4. Enablers of technology integration into instruction in Manas University (Research Question 2)

The second research question in this study was about the enablers of technology integration into instruction according to instructors and students. The data for instructors was collected through the questionnaire and interviews, and data from students was collected through the questionnaire.

4.4.1. Possible enablers to ICT integration according to Instructors

The enablers most strongly agreed by the majority of instructors were "In-service training about ICT should be improved in quality and quantity" (M=3.96), "More budget should be allocated to ICT" (M=3.91), "Technology plans for implementing ICT in universities should be prepared" (M =3.89), "Specific units and personnel should be allocated to peer support" (M=3.89), "Specific units and personnel should be allocated for public use of ICT tools" (M=3.88), "The faculty members who integrate ICT in their courses should be supported (such as additional resources, education, etc.)" (M=3.82), and "The course content should be redesigned to acquire more benefit from ICT" (M=3.79), except the statements "The faculty members who integrate ICT in their courses should be supported (such as incentive payment)"

(M=3.58) and "The course load of the faculty members should be decreased" (M=3.04) which they agreed with (Table 4-11).

Table 4-11: Enablers of technology integration according to instructors

Enablers	M	SD
More budget should be allocated to ICT	3.91	.85
In-service training about ICT should be improved in quality and quantity	3.96	.92
The course content should be redesigned to acquire more benefit from ICT	3.79	.90
Specific units and personnel should be allocated to peer support	3.89	.92
Specific units and personnel should be allocated for public use of ICT tools	3.88	.91
Technology plans for implementing ICT in universities should be prepared	3.89	.79
The course load of the faculty members should be decreased	3.04	1.03
The faculty members who integrate ICT in their courses should be supported (such as additional resources, education etc.)	3.82	.95
The faculty members who integrate ICT in their courses should be supported (such as incentive payment)	3.58	.94
Overall mean	3.75	

Table 4-12: Major findings on enablers

Enablers	f
In-service training about ICT should be improved in quality and quantity	7
The faculty members who integrate ICT in their courses should be supported	4
The course content should be redesigned to acquire more benefit from ICT	2
The course load of the faculty members should be decreased	1

- **In-service training about ICT should be improved in quality and quantity**

Qualitative interview results go in line with questionnaire results. Seven instructors mentioned that in-service training about ICT should be improved in quantity and quality. Most of them stated they have to learn how to integrate ICT on their own, and there is no in-service training provided. Furthermore, instructor from Computer Engineering department stated: "During Soviet period there were courses to increase qualification, every 4 year you had to attend them. I was there in 1998 las

time, university sent us for a half year or 1 semester to Moscow, and for this period we learned, and prepared for new course. Here there was not and still there is no such a thing" (Appendix E.15). He proposed that university could provide instructors from other universities for one week to teach lectures, but there is no such thing, and was not in the last 7 years.

- **The faculty members who integrate ICT in their courses should be supported (such as incentive payment)**

Four instructors stated that faculty members who integrate ICT in their courses should be supported (such as incentive payment). One of the instructors suggests: "For those who use technology to be a motivation in anomymous questionnaire there should be a question how frequently instructor use technology. If that instructor takes 5 for that question, and instructor would get a salary based on it, then he/she would work better. If would be better if that question is added to general evaluation. That questionnaire is conducted annually but there is no change, neigher neither in the faculty nor in the department. If the salary is paid according to evaluation then it will be a motivation" (Appendix E.16)

- **The course content should be redesigned to acquire more benefit from ICT**

Two instructors mentioned that course content should be redesigned to acquire more benefit from ICT. One instructor indicated that there is a big difference in teaching method between Turkish and Kyrgyz instructors. Most of the instructors are from old Soviet generation who did not use internet. Furthermore, she mentioned about the absence of initiative in Kyrgyz instructors, they are not willing to contact with Turkish instructors because of they age and language barrier. She stated: "most of the courses in our department are taught in Kyrgyz language, and there only a few instructors who teach in Turkish. Students complain and state that they want the lectures to be in Turkish. Moreover, the system of education is very old; it is a Soviet system which cannot be applied now. We need to change this system and start using modern systems instead of old. However, most of the instructors in some

61

departments are very old, and due to their age they do not want and they cannot use modern system or internet" (See Appendix E.17).

Another instructor also mentioned about the iniciative of instructors. He proposed that it depends on initiative; if instructor wishes to use ICT he should do something, and administration will support.

- **The course load of the faculty members should be decreased**

Instructor (Marat) from Computer Engineering department noted that due to the course overload instructors in Computer Engineering do not have opportunity and time to prepare electronic materials. There are some instructors who had to teach 19 courses because of lack of instructors. Instructors are not motivated to prepare electronic materials, because they will have to teach another course: "I think that if every instructor would prepare his subject in electronic format, and if he/she would be sure that he will teach that course, he would try. But if tomorrow another instructor will teach that lecture, then no, he/she is not motivated" (See Appendix E.18). Because instructors in Computer Engineering have to teach computer courses to other faculties and departments they are overloaded and don't have time to prepare electronic material. As a solution instructor (Marat) proposed to separate teaching computer courses by instructors of Computer Engineering Department.

4.4.2. Enablers of technology integration according to students

43.4% of the students state that the most important enabler of technology according to their points of view is that technology helps them to improve and enhance their learning. 22% of students think that technology saves their time, 20% think that it helps them in the process of planning course activities, and 18% stated that technology gives them a comfort during studying. However, 10% of students think that technology is not useful at all in education.

As it is shown in Table 4-11, enablers most strongly agreed by the majority of students are: "Grades should be available online" (M=3.71), "More opportunity should be provided for use of technology by students during instruction" (M=3.66), "Instructors should be supported to use technology during instruction" (M=3.66),

"Courses prepare me for use of technology in career field" (M=3.65), "Each course should have its own website" (M=3.63), "Instructors should be evaluated on how they use ICT during instruction" (M=3.63), and less agreed with the following statements: "All courses syllabuses should be available online and be updated" (M=3.6), and "Instructors are responsible for use of technology during instruction for the purpose of communication and explanation" (M=3.57).

Table 4-13: Enablers of technology integration according to students

Enablers	M	SD
More opportunity should be provided for use of technology by students during instruction	3.66	1.07
Each course should have its own website	3.63	1.11
Instructors should be supported to use technology during instruction	3.66	1.02
Instructors should be evaluated on how they use ICT during instruction	3.63	.96
Grades should be available online	3.71	1.09
All courses syllabuses should be available online and be updated	3.60	1.03
Courses prepare me for use of technology in carreer field	3.65	1.17
Instructors are responsible for use of technology during instruction for the purpose of communication and explanation	3.57	.99
Overall mean	3.64	

4.5. Perceived ICT and Computer Competencies (Research question 3)

The third research question in this study was about perceived ICT and Computer competencies of Instructors and Students. The data for both instructors and students were collected through the questionnaire and interview.

4.5.1. Perceived ICT competencies of Instructors

The competencies include fundamental concepts, knowledge and skills on basic ICT competencies, and advanced ICT competencies. Instructors rated their levels of agreements with statements by using five-point Likert Type scale (5 –

Completely Sufficient, 4- Sufficient, 3 – Neutral, 2 – Insufficient, 1 – Completely Insufficient).

Means and standard deviations, and total percentages of instructors are provided in Table 4-12. The results indicate that instructors perceive themselves the most competent in "Use of ICT for communication" (M=4.04), and "Use of word processors for personal and institutional purposes" (M=4.04), "Use of presentation software for personal and institutional purposes" (M=4.00), and "Identify legal, ethical and societal issues related to use of ICT" (M=3.98). While they perceive themselves as least competent in "Use of hypermedia and multimedia tools to support instruction" (M=3.33), Integrate ICT into courses (curriculum) (M= 3.37).

Table 4-14: ICT competencies of instructors

Competencies	M	SD
Use of operating systems	3.89	1.09
Use of ICT to support instruction process in classroom	3.75	1.12
Use of ICT to support instruction out of classroom	3.68	1.05
Use of ICT in implementation process of a course	3.63	1.09
Use of ICT in assessment process of a course	3.74	1.00
Use of computer aided instruction materials	3.82	.98
Evaluation of computer aided instruction materials	3.72	1.03
Use of ICT to enhance personal and professional development	3.89	.90
Identify, select and evaluate ICT resources	3.49	1.04
Integrate ICT into courses (curriculum)	3.37	.99
Use of hypermedia and multimedia tools to support instruction	3.33	1.17
Use of communication tools to support instruction	3.51	1.02
Use of ICT for problem solving	3.58	.99
Use of ICT for collecting data	3.84	.88
Use of ICT for knowledge management	3.61	1.03
Use of ICT for communication	4.04	.82
Use of ICT for decision-making	3.44	1.02
Use of word processors for personal and institutional purposes	4.04	.92
Use of spreadsheets for personal and institutional purposes	3.86	.93
Use of presentation software for personal and institutional purposes	4.00	.96
Identify legal, ethical and societal issues related to use of ICT	3.98	.95
Overall mean	3.72	

4.5.2. Perceived Computer competencies of students

Computer Competency Scale includes Computer basic concepts, Computer Hardware, Operating Systems, Word Processors, Spreadsheets, and Demonstration Programs (Table 4-13). Students rated themselves using Likert-Type 3 point scale (1- Poor, 2 – Medium. 3 –Proficient). As it can be seen from Table K, students perceive themselves most proficient at Word Processors (M=2.43, SD=0.67), and Computer Basic Concepts (M=2.37, SD=0.67), and least proficient at Operating Systems (M=2.30, SD=.69), Demonstration Programs (M=2.25, SD=0.73), Spreadsheets (M=2.15, SD=0.73), and Computer Hardware (M=1.94, SD=0.72)

Table 4-15: Students Computer Competencies

Competencies	M	SD
Computer basic concepts	2.37	.67
Computer Hardware	1.94	.72
Operating Systems	2.30	.69
Word processors	2.43	.67
Spreadsheets	2.15	.73
Demonstration programs	2.25	.73
Overall Mean	2.24	

4.6. To what extent instructors and students use ICT during education? (Research question 4)

The fourth research question in this study was about the level of use of ICT by Instructors and Students. The data for both instructors and students were collected through the questionnaire and interviews.

4.6.1. Using ICT by instructors during instruction

Instructors were asked if they were using ICT during instruction. Results indicate that 8.8% were not using ICT during instruction, 63.2% were using ICT during instruction, and 28.1% were partially using ICT during instruction.

4.6.2. Instructors Use of the Internet as a Supportive Tool in Their Courses

35.1% of instructors stated that they use Internet as a supportive tool in their courses, 29.8% use it partially, and 35.1% don't use internet in their courses. Instructors who were using the internet in their courses as a support tool were asked how they were using the Internet. The results showed that 24 instructors use search engines, 20 instructors use open courseware, 15 instructors use e-mail , 12 instructors use web page for supporting their lesson, 3 use chat, and only 1 instructor use forum to support their lessons.

4.6.3. Hardware Used by Instructors

Instructors rated their levels of agreement with the statements by using a five-point Likert-type scale (5 indicating "Always", 4 indicating "Often", 3 indicating "Sometimes", 2 indicating "Never", and 1 indicating "No idea about it"). As it is indicated in Table 4-14, the most frequently used hardware by instructors were Personal Computer (M=4.28), following by Printer (M=3.66), and Projector (M=3.49). The least frequently hardware was Tape (M=2.12), TV (M=2.15), and Camera (M=2.17).

Table 4-16: Use of Hardware

Hardware	M	SD
PC	4.28	.99
Printer	3.66	1.17
Scanner	3.01	.93
Projector	3.49	1.07
Overhead projector	2.33	.74
Video	2.37	.77
Camera	2.17	.60
TV	2.15	.56
Tape	2.12	.57
Overall		

4.6.4. Software Used by Instructors

Participants rated their levels of agreement with the statements by using a five-point Likert-type scale (5 indicating "Always", 4 indicating "Often", 3 indicating "Sometimes", 2 indicating "Never", and 1 indicating "No idea about it"). As it is indicated in Table 4-15, the most frequently used software by instructors were "Word Processor" (M=3.66), and "Presentation Programs" (M=3.67). The least frequently software used by instructors were "Web Page Development" (M=1.93), and "Learning Management System" (M=1.93). Learning Management System was not available in Manas University in 2010-2011 years that might be the reason of least frequent use of it by instructors.

Table 4-17: Use of Software

Software	M	SD
Word Processor (e.g., MS Word)	3.66	1.18
Spreadsheets (e.g., Excel)	3.10	1.01
Presentation Programs (e.g., PowerPoint)	3.67	1.01
Web Browsers (e.g., Internet Explorer)	3.42	1.29
Operating Systems (e.g., Windows)	2.22	1.09
Receiving/sending e-mail	3.14	1.30
Web Programming (e.g., HTML)	1.94	.58
Web Page Development (e.g., FrontPage)	1.93	.68
Image Editing (e.g., Photoshop)	2.26	.86
Databases (e.g., Access)	2.12	.87
Reference Programs (e.g., Dictionary)	2.40	1.07
Animation Programs (e.g., Flash)	2.15	.80
Forum	2.00	.57
Learning Management System (e.g., WEB CT)	1.93	.62
Chat	2.26	.88
Desktop Publishing (e.g., Corel Draw)	2.26	.86
Video Conference Programs	2.01	.58
Instructional Game	2.00	.63
Simulation	2.03	.71
Overall mean		

Table 4-15 can be categoried into 3 main categoris: basic computer skills (Word Processor, Spreadsheets, Presentation Programs, Web Browsers, and Receiving/sending e-mail, Forum), intermediate computer skills (Databases, Image Editing, Reference Programs, Chat, Desktop Publishing, Learning Management

System, Video Conference Programs, Instructional Game, Simulation), and advanced computer skills (Animation Programs, Operating Systems, Web Programming, Web Page Development).As results show instructors have the highest means for basic computer skills, following by intermediate computer skills, and are least proficient in advanced computer skills.

The results of qualitative interviews are in line with quantitative results. Majority of the instructors mentioned that Computer, Projector, and Printer are the most frequently used Hardware programs, while MS Word, Presentation programs, and Web browsers are the frequently used Software programs.

4.6.5. Students' perceptions on ICT used by Instructors and Students

Students stated that 65.2% of instructors use whiteboard during instruction, 55.1% of instructors use printed material, 26.6% use computers, 39.8% use projectors; only 6.1% use the Internet and 8.4% use videos during instruction.

However, the results are different for students: 74% of the students stated that they use the Internet for their education, 51% use computers, 57% use hard copy material, 26.2% use cell-phones, 13.2% use chat-forum-instant messaging, and only 6.3% of the students use sound-recorder for their education.

The results of qualitative interviews go in line with the quantitative results. In addition, most of the students stated that wifi is available throughout the university, so that is it easier to access the new information through the Internet. Students can bring their own laptop and access the most up-to-date information. Furthermore, most of the students access the internet to get the information they need.

One of the students' states: "For example, there are only few projectors and it might be not enough for each lecture. Half of the instructors know how we can integrate technology during instruction and half of them do not know. I can say that young instructors know better, and the instructors from Soviet period do not know at all. They do not want to learn. Technical support is also not enough, instructors learn on they own. There are courses open for old instructors but old instructors do not attend. They are open each semester but because they are not attending that courses, courses are not compulsory" (See Appendix E.19)

Furthermore, one student mentioned: "we can see the difference in teaching by the part-time instructors who come from other universities. They do not have they own room with PC and internet access in the university, and their learning materials are very old, they give us some literature and we see that it is old. They cannot access the new information and its' very sad. They have lack of knowledge and training on how to use technology, and they see that can use technology here. But full time instructors come with ready material or PowerPoint slide shows, and they use new literature" (See Appendix E.20).

4.6.6. Expected ICT during instruction

The results show that most of the students (60.4%) ask for videos related to the course topic, 54.5% of students want a course web site with lecture notes and additional resources, 44.4% want handouts. Furthermore, 38.8% of the students expected Internet based communication through emails and forum which provides effective communication with instructors, 38% of them expect rich learning environments with simulations, 36.5% of them want Power Point presentations with projectors, and 27.5% of students want e-learning platform and online lectures.

The instructors' results on the frequently-used technologies are different from students' expected technologies. Majority of the instructors (68.4%) never use videos and 80.7% of instructors never use TV and camera for instruction. More than half of the instructors (57.9%) state that they always use computers, only 22.8% of instructors always use projectors and 29.8 % always use printers. Furthermore, Simulations are between the least frequently used software by instructors (M= 3.96, SD= 0.71) as it it shown in Table 23.

One of the instructors stated during interview that university has an FTP, where instructors can upload information to be used for students.

4.6.7. Students' perceptions on opportunities that technology provides (ICT integration)

52,8% of the students agree that technology helps them to better understand the topics; 40.7% state that technology helps them to be more motivated towards the course; 48.8% think that technology increase the quality and efficiency of the education received; 50.9% agree that technology helps to gain a permanent knowledge; 6.1% believe that technology has no effect on their learning.

The most important observed problems to use technology during instruction according to students' are: 42.3% deficiency of laboratories; 31.1 % instructors' lack of knowledge and experience about technology; 21% problems with hardware; 19.3% deficiency of qualified technical personnel; 18.7% deficiency of software.

In addition to questionnaires, during the interviews students were asked about their perceptions of ICT integration into education through the interviewees. Almost all of the students stated that there is as positive so a negative effect of technology on education. But most of the students agree that there are a lot of positive effects of ICT integration during instruction, as: "technology helps to access information anytime and anywhere, find any information"; "access to the last up-to-date information can be accessed with the help of technology via internet"; "it helps to be professional in specific area"; "its much more easy to understand when you see video instead of reading, more effective and useful";

4.7. SUMMARY OF THE CHAPTER

In this chapter the data collected from instructors and students have been analyzed and presented. Results show (Table 4.7-1) that major barriers according to instructors are: lack of in-service training about ICT, lack of hardware, lack of time for integration ICT in classroom, lack of material for instruction, and Lack of financial support by university to invite specialists who use technology very well and can teach others. For students the major barriers are: lack of access to computers out

of class, the cost of computers, and lack of hardware, lack of knowledge and skills of faculty members about ICT.

As possible enablers of technology integration according to instructors are: "In-service training about ICT should be improved in quality and quantity", "More budget should be allocated to ICT", "The faculty members who integrate ICT in their courses should be supported (such as incentive payment), "Technology plans for implementing ICT in universities should be prepared", "Specific units and personnel should be allocated to peer support", "Specific units and personnel should be allocated for public use of ICT tools", "The faculty members who integrate ICT in their courses should be supported (such as additional resources, education, etc.)", and "The course content should be redesigned to acquire more benefit from ICT".

Possible enablers for students are: "More opportunity should be provided for use of technology by students during instruction", "Instructors should be supported to use technology during instruction", and "Instructors should be evaluated on how they use ICT during instruction".

CHAPTER 5

DISCUSSION AND CONCLUSIONS

The purpose of this study was to investigate the major barriers and possible enablers of technology integration into instruction in a Kyrgyzstan-Turkey Manas University according to instructors and students. The focus of the study was to show how instructors and students use ICT in terms of major barriers, possible enablers for integrating ICT, use of ICT during education, ICT competencies, students perpections on modern university and use of ICT by instructors. Sequential explanatory mixed method research design was used where quantitative questionnaries were the main data collected from instructors and students, and qualitative interviews was complementary and conducted after analyzing quantitative questionnaries, to help explain the results of quantitative questionnarie. The chapter begins with major findings and discussions about research questions and continues with implications for practice and further research.

5.1. MAJOR FINDINGS AND DISCUSSION ABOUT RESEARCH QUESTIONS

As results of the study shows majority of instructors and students have a positive perception on using ICT during instruction. Instructors wish to integrate technology into instruction, but need a training and support from university administration, and technical support.

Barriers of technology integration into instruction in Manas University

Results show that major barriers according to instructors are:

- Lack of in-service training about ICT
- Lack of computer access for students out of class

- Lack of basic knowledge and skills about ICT

- Lack of technical support

- Lack of appropriate software

- Lack of hardware

- Lack of time for integration ICT in classroom

- Lack of materials for instruction.

The identified barriers are consistent with findings from literature, studies of Ertmer, 1999, Simpson et al (1999), Veen (1993), Lee (1997), Preston et al. (2000), Manternach-Wigans et al (1999), Goktas (2004), Beggs (2000), and Newhouse (1999).

Similarly as in this study, lack of training was identified as a major barrier in studies conducted by Willis, Thompson & Sadera (1999), Shrum (1999), and Goktas (2004); Lack of hardware in the studies (Beggs, 2000; Butler & Sellbom, 2002); Lack of time and lack of technical support (Cuban (2001); Larson, 2003; Brill and Galloway, 2007); Lack of software and technical support (Cuban, 2001; Goktas, 2004; Al-Senaidi et al, 2008). As Cuban stated, technical support and professional development need to be redesigned to make it more "responsive to the organizational incentives and workplace constraints teachers' face" (Cuban, 2001, p. 183).

Nicolle (2005) found that faculty members' attitudes and motivation toward ICT play a big role in how they integrate ICT. Furthermore, the following barriers were mentioned by Cuban, Kirkpatrick, and Peck (2001) to use technology more innovatively: (1) lack of teachers' time teachers to find and evaluate software; (2) lack of training; (3) available training did not meet needs of the teachers.

For students the major barriers are:

- Lack of access to computers out of class

- Cost of computers

- Lack of hardware

- Lack of knowledge and skills of faculty members about ICT.

The reason of lack of materials for instructions is might be due to the system of education in Kyrgyzstan, which is inherited from Soviet Era. Most of materials are poor designed and outdated (World Bank and OECD, 2010).

As the results for students show, computer cost is still the most important barrier for students. Most of the students do not have a personal computer due to the high cost, which is a barrier. Connection to the internet is another barrier. Furthermore, students are still experiencing problems with internet connection. The results are in line with report of Asian Development Bank (2012) and study conducted by Akin (2013). The internet connectivity in Kyrgyzstan was only 3-5% due to lack of adequate financial resources in school budgets, and lack of technical access to the Internet. ICT in schools restricted to the teaching of informatics and computers skills (Asian Development Bank, 2012). A study was conducted by Akin (2013) on computer and internet usage in higher education in Kyrgyz University. The results of the survey of university students showed that 53% of students do not have personal computer at home, and 74% of them stated that it is too expensive. Furthemore, 74% of students having computer at home do not have internet connection, and 62% of them stated that cost of internet is too expensive. Furthermore, there is only 1 computer for 38 students in one of the better resources public Higher Education Institutions (Reviews of National Policies for Education, Kyrgyz Republic 2010).

Enablers of technology integration into Manas University

As possible enablers of technology integration according to instructors are:

- In-service training about ICT should be improved in quality and quantity
- More budget should be allocated to ICT
- The faculty members who integrate ICT in their courses should be supported (such as incentive payment)
- Technology plans for implementing ICT in universities should be prepared
- Specific units and personnel should be allocated to peer support
- Specific units and personnel should be allocated for public use of ICT tools

- The faculty members who integrate ICT in their courses should be supported (such as additional resources, education, etc.)
- The course content should be redesigned to acquire more benefit from ICT

As one of the instructors mentioned during the interview there is a big difference in teaching method between Turkish and Kyrgyz instructors. Most of the instructors are from old Soviet generation who did not use internet. She stated: "most of the courses in our department are taught in Kyrgyz language, and there only a few instructors who teach in Turkish. Students complain and state that they want the lectures to be in Turkish. Moreover, the system of education is very old; it is a Soviet system which cannot be applied now. We need to change this system and start using modern systems instead of old. However, most of the instructors in some departments are very old, and due to their age they do not want and they cannot use modern system or internet". The results are in line with report of World Bank and OECD (2010).

In addition, two instructors also mentioned about the initiative of instructors. One of instructors proposed that it depends on initiative; if instructor wishes to use ICT he should do something, and administration will support. So, it means that university administration will support instructors' initiative. As it was observed generally during interviews with Kyrgyz instructors, they have a fear of loosing their jobs that might be a reason of lack of initiative. As one of the instructors stated during interviews, the salary in Manas University is better than in other public universities. Most of instructors from other universities wish to work in Manas University. Due to this, Manas University is competitive in terms of salaries, and one of the instructors mentioned that he cannot propose anything to university administration, because of fear that they might not support, and say: "If you don't like you can find another job for you". There is no evidence of such case before, but it is observed that some of the interviewed Kyrgyz instructors have a fear of losing a job at Manas University. According to Manas University improvement report (2013) they apply approach of hiring personnel from quantity to quality. In the last 3 years 162 new academic personnel were hired, and 111 academic personnel has left the job at Manas University due to the different reasons (Manas University, 2013).

Furthermore, for Computer Engineering Department Instructors course overload should be decreased. As one of instructors stated due to the course overload instructors in Computer Engineering do not have opportunity and time to prepare electronic materials. There are some instructors who had to teach 19 courses because of lack of instructors. Instructors are not motivated to prepare electronic materials, because they will have to teach another course:

"I think that if every instructor would prepare his subject in electronic format, and if he/she would be sure that he will teach that course, he would try. But if tomorrow another instructor will teach that lecture, then no, he/she is not motivated".

As a solution instructor proposed teaching of computer courses to be separated from Computer Engineering Department, so that instructors will have more time to concentrate on their special subjects and motivated to prepare electronis materials for their courses.

Most of students believe that technology helps them to improve and enhance their learning, and possible enablers for students are:

- More opportunity should be provided for use of technology by students during instruction
- Instructors should be supported to use technology during instruction
- Instructors should be evaluated on how they use ICT during instruction

As for opportunity that technology provides which is stated is the deficiency of laboratories for students. Due to high cost of computer the major barriers for students is the cost of computer. As a solution one of students during interview proposed that university can give opportunity for student to buy laptop, divide cost of computer on 12 months or more.

Furthermore, both instructors and students agree that "Instructors should be supported to use technology during instruction". As it was observed from interviews at the moment instructors can use ICT during instruction, but it is not compulsory and there is no evaluation on how they use ICT during instruction. One of the instructors also proposed to be evaluated on how they use ICT, and as a motivation for instructors to use ICT more frequently salary should be increased for those who use it.

Technology is not useful at all in education for 10 % of students. One of students complained: "Now most of the people are not reading books anymore, they spend most of their time in the internet. Most of their time they spend on different sites and especially on social networking sites". She mentioned that student loose they time on internet and social networking sites In addition; two students stated their negative perceptions. They state that there is an information dependency; social networks which takes so much valuable time; access to the number of internet sites and access to those sites is not under the control of the government which restricts the effective use of the technology; spending a lot of time searching for information on the Internet; technology has a negative effect for health;

Perceived ICT and Computer competencies of instructors and students

The results indicate that instructors perceive themselves the most competent in:

- Use of ICT for communication
- Use of word processors for personal and institutional purposes
- Use of presentation software for personal and institutional purposes

Overall instructors perceived themselves as competent, while they are competent most on: Use of word processors for personal and institutional purposes", "Use of ICT for communication", Use of presentation software for personal and institutional purposes".

The results of qualitative interviews showed that the most frequently software used by majority of instructors are MS Word, Presentation programs, and Web Browsers. However, as results show instructors perceive themselves as least competent in "Use of hypermedia and multimedia tools to support instruction", "Integrate ICT into courses (curriculum)".

Instructors are least competent on use of hypermedia and multimedia tools to support instruction, because university did not have any Course Management Tool where instuctors could use them. Furtheremore, the reason why instructors perceive themselves as least competent on "Integrate ICT into courses" is the need of training

to integrate ICT into courses, and as results of qualitative interviews shows, they want to receive training on how to integrate ICT into instruction.

Students perceive themselves most proficient at:

- Word Processors
- Computer Basic Concepts

Students perceive themselves least proficient at Computer Hardware. Students were not expected to be proficient at using Computer Hardware, expect students from Computer Engineering Department.

Instructors and students use of ICT during education

Students stated that they use most for education:

- Internet
- Computers
- Hard copy materials
- Cell-phones.

The results of qualitative interviews go in line with the quantitative results. In addition, most of the students stated that wifi is available throughout the university, so that is it easier to access the new information though the internet. Students can bring their own laptop and access the most up-to-date information. Furthermore, most of the students access Internet to get information they need.

The results of this study show that students' expectations regarding the technologies are different than actual technologies used by instructors of Manas University in Kyrgyzstan. Most of the students expect videos related to topic, course web site with lecture notes and additional resources, and handouts. However, most of instructors have never used videos for their instructional purposes.

Furthermore, students think that course content and additional services should be reachable online, and they would like to reach instructors in the virtual environment too. Most of the students want to use web sites with lecture notes and additional resources, while Learning Management System is the least frequently used software by instructors. Moreover, students want to have electronic library, and videos related with course content. In order to solve this problem one of the options could be

implementing on LMS (Learning Management System) like Moodle, or Blackboard. By this way communication between students and instructors can increase and course materials can be accessible 24 hours.

Majority of students agree that technology helps them to better understand the topics, helps them to be more motivated towards the course, increase the quality and efficiency of the education received, and technology helps to gain a permanent knowledge. However, there is a small part of student who believes that technology has no effect on their learning.

In addition to questionnaires, during the interviews students were asked about their perceptions of ICT integration into education through the interviewees. Almost all of the students stated that there is as positive so a negative effect of technology on education. But most of the students agree that there are a lot of positive effects of ICT integration during instruction, as: "technology helps to access information anytime and anywhere, find any information"; "access to the last up-to-date information can be accessed with the help of technology via internet"; "it helps to be professional in specific area"; "its much more easy to understand when you see video instead of reading, more effective and useful";

5.2. CONCLUSION

Overall, regarding the barriers of ICT integration into instruction, as results show there is still deficiency of laboratories, instructors' lack of knowledge and experience about technology, deficiency of hardware and software, and lack of qualified technical personnel.

As seen from the findings, there is a definite lack of instructional support services at Manas University. So, as in the case of many developed universities, Manas University has to establish a center or an office to provide instructional technology support for faculty members. The lack of knowledge of faculty in technology integration into education can be decreased by providing hands-on seminars, handouts and training courses. Moreover, a technical support unit is also necessary to eliminate hardware and software problems of both instructors and students. As seen from the students' requests, they want more interactive course materials. For this

purpose, an open courseware portal can be prepared. As in the MIT's OCW (Open courseware) site, Manas university course materials can be shared by all Kyrgyzstan universities. The university should also prepare a strategic plan to make long term instructional technology decisions. Furthermore, course content can be restructured in a way to provide additional information online through the local OCW or in any other ways.

As the results indicate, there are a lot of problems with integrating ICT during instruction due to the reasons mentioned above from students' and instructors' perspectives. Moreover, instructors need in-service training about ICT, technical support, appropriate software and materials for instruction. Those are the most important barriers for instructors.

The results of this study can be generalized to the Kyrgyzstan-Turkey Manas Univesity, since it presents the situation with ICT from both instructors' and students' perspectives. Overall, the situation with the technology integration and technological base in Manas University can be considered 'better' than other governmental universities of Kyrgyzstan. But still there are a lot to do. The results of this study can be used by Manas University as a guideline for improvements. Moreover, Ministry of Education in Kyrgyzstan can take Manas University as an example, and make the necessary steps to improve the situation from both Computer technologies and Instructional technologies sides in other governmental universities.

Furthermore, the results of the study present the current picture of ICT in one of the Kyrgyzstan universities with a good technological infrastructure. However, if Kyrgyzstan wants to be a part of Knowledge societies, using ICT in education should be improved not only in Manas University, but in other universities as well. Manas University might play a crucial role to in the development of Knowledge Society in Kyrgyzstan by providing necessary training to instructors, being a guideline for the improvements in other governmental universities.

5.3. RECOMMENDATIONS FOR FURTHER RESEARCH

This study shows that students are eager to use technology more extensively during the instruction; they use cell phones for instructional purposes. In spite of the main barrier for students as a cost of computers, in spite of the limited Internet connectivity at home, students are still motivated to use ICT. They expect instructors to use ICT, while instructors' main barrier is the lack of training and technical support to use ICT. There are a number of instructors, who learn how to use ICT on their own, and need to be supported by training and support both from university administration, and technical support.

The results of this study can be generalized to Kyrgyzstan-Turkey Manas university instructors and students. However, there only a few studies conducted on use of ICT by students and instructors in higher education in Kyrgyzstan. Even if this study shed light on how technology is used by instructors and students, the instruments used can be translated to Russian and Kyrgyz language, and be used for the future studies by other researchers.

The Ministry of Education can use the results of this study and conduct more detailed study in other universities, or to see the whole picture in other governmental universities in Kyrgyzstan.

5.4. IMPLICATION FOR PRACTICE

Instructors should be provided with training on how ICT can be used more effectively during instruction. University administration should allocate qualified technical personnel, who can provide technical support when instructors have problems. Furthermore, there is a deficiency of hardware: laboratories, and projectors. The problem might be solved by increasing the number of projectors to be used for educational purposes.

From students perspectives the results show that students want to use simulations, and videos related with lectures. University management can provide in-service training for instructors, they can prepare technological plan for effective training and using of ICT by both students and instructors.

University instructors might work together with Ministry of Education on developing more accessible literature on Kyrgyz Language. One of the languages of instruction in Manas University is Kyrgyz, so instructors too might be motivated to develop electronic resources in Kyrgyz Language.

SUGGESTIONS FOR UNIVERSITY MANAGEMENT

1. Provide in-service training for instructors

As results show majority of instructors want to use ICT during instruction, they indicated lack of in-service training as a major barrier, and stated that wish to receive and in-service traning in university.

2. Invite instructors to teach how to integrate ICT during instruction

As one of the instructors mentioned university might invite instructors from other universities to train instructors on how to integrate ICT during instruction. Instructors from Turkey can be invited to give seminars, and share their knowledge on effective integration of ICT during instruction

3. Increase the number of resources in Kyrgyz language

Instructors stated that there is lack of materials/resources in Kyrgyz language, and materials are old and from Soviet Union. Materials in Kyrgyz language should be increased and modernized.

4. Increase the number of laboratories for students to be used out of class

Both students and instructors mentioned about lack of laboratories for students to be used out of class. Students should have opportunity to work out of class, and number of laboratories should be increased.

5. Support Instructors who use ICT during instruction

Instructors who use ICT during instruction should be supported: such as incentive payment, additional resources, education.

6. Allocate additional instructors to teach Computer Courses

For instructors of Computer Engineering department to decrease the overload and to have time to be concentrated on improving courses Computer Courses.

7. Technical support

Technical support should be allocated to support instructors to use projectors/ solve problems with printers and photocopy mashines on time

8. Number of photocopy machines and printers should be increased

As it was mentioned in the interviews in one building there is only 1 photocopy machine, and students have to make copy out of campus, which takes time

9. Learning Management Systems should be allocated

Students want to reach materials 24 hours,

10. Open courseware portal should be prepared

Learning materials should be prepared in Kyrgyz and Turkish language for each course

11. Strategic plan should be prepared

Strategic plan should be prepared by university to make long term instructional technology decisions.

REFERENCES

Akin, M. S. (2013). Computer and internet usage in higher education in developing countries: case for Kyrgyz university students. *International Journal of Information Technology and Business Management*, *12*(1), 41- 48.

Al-Oteawi, S. M. (2002). The perception of administrators and teachers in utilizing information technology in instruction, administrative work, technology planning, and staff development in Saudi Arabia. Unpublished doctoral dissertation. Ohio State University.

Al-Senaidi, S. *An investigation of factors affecting Omani faculty members' adoption of information and computing technology*, PhD thesis, University of North Texas, 2009.

Albirini, A. (2006). Teachers' attitudes toward information and communication technologies: The case of Syrian EFL teachers. *Computers and Education 47* (4), 373–98.

Afshari, M., Bakar, K. A., Su Luan, W., Samah, B. A., & Fooi, F.S. (2009). Factors affecting teachers' use of information and communication technology. *International Journal of Instruction.* 2(1), 77-104.

Asian Development Bank Annual Report (2012), retrieved November 20, 2013 from http://www.adb.org/documents/adb-annual-report-2012

Bates, A. W., & Poole, G. (2003). Effective Teaching with Technology in Higher Education: *Foundations for Success*. ERIC.

Balanskat, A., Blamire, R. & Kefala, S. (2006), *The ICT Impact Report: A Review of Studies of ICT Impact on Schools in Europe,* European Schoolnet.

Becker, H. J. (2000). Findings from the teaching, learning, and computing survey: Is Larry Cuban right? *Education policy analysis archives*, *8*(51).

Beggs, T. A. (2000). Influences and barriers to the adoption of instructional technology. ERIC.

Bennett, J., & Bennett, L.(2003). A review of factors that influence the diffusion of innovation when structuring training program. *Internet and Higher Education, 6*(1)*,* 53-63.

Brill, J., & Galloway, C. (2007). Perils and promises: University instructors' integration of technology in classroom-based practices. *British Journal of Educational Technology*, *38* (1), 95-105.

Butler, D. L., & Sellbom, M. (2002). Barriers to adopting technology. *Educause Quarterly, 2*, 22-28.

Creswell, J. W. 2003. *Research design: Qualitative, quantitative, and mixed methods approaches*. 2nd ed. Thousand Oaks, CA: Sage.

Creswell, J. W., & Plano Clark, V. L. (2007). Designing and conducting mixed methods research. Thousand Oaks, CA: Sage

Cuban, L. (2009). *Oversold and underused: Computers in the classroom*. Harvard University Press.

Cuban, L., Kirkpatrick, H., & Peck, C. (2001). *High access and low use of technologies in high school classrooms: Explaining an apparent paradox. American Educational Research Journal, 38(4), 813-834.*

Dawes, L. (2001). What stops teachers using new technologies? In M. leask (Ed.), *Issues in teaching using ICT* (pp. 61-79). London. Routledge.

Diehl, D. E. *A study of faculty-related variables and competence in integrating instructional technologies into pedagogical practices*. PhD thesis, Texas Southern University, 2005.

Ertmer, P. A. (1999). Addressing first- and secondorder barriers to change: Strategies for technology integration. *Educational Technology Research and Development, 47*(4), 47–61.

Gesci (2009) Building a Knowledge Society for All, retrieved on December 2013 from http://www.gesci.org/assets/files/Strategic%20Plan%2009%20-11.pdf

Göktaş, Y. *The current status of information and communication technologies integration into schools of teacher education and K-12 in Turkey*. PhD thesis, Middle East Technical University, 2006.

Goktas, Y., Yildirim, S., & Yildirim, Z. (2009). Main Barriers and Possible Enablers of ICTs Integration into Pre-service Teacher Education Programs. *Educational Technology & Society*, *12* (1), 193–204.

Gülbahar, Y., (2008). ICT usage in higher education: a case study on preservice teachers and instructors, *The Turkish Online Journal of Educational Technology, 7*(1), 32-37.

Ihmeideh, F. M. (2009). Barriers to the Use of Technology in Jordanian Pre-School Settings. Technology, *Pedagogy and Education*, 18(3), 325-341.

ITU (2013), Measuring the Information Society, retrieved on January 2014 from

http://www.itu.int/en/ITUD/Statistics/Documents/publications/mis2013/MIS2013_without_Annex_4.pdf

Jones, A. (2004). A review of the research literature on barriers to the uptake of ICT by teachers. *British Educational Communications and Technology Agency (BECTA)*.

Kozma, R.B. (2008). *International Handbook of Information Technology in Primary and Secondary Education* Springer Volume 20, 1083-1096.

Keengwe, J., G. Onchwari, et al. (2008). Computer Technology Integration and Student Learning: Barriers and Promise. *Journal of Science Education and Technology* 17(6), 560-565.

Larson, L.L. *A descriptive study of technology integration and faculty professional development in one higher education institution*. Ph.D. thesis, Pepperdine University, 2003.

Lee, K. (2000). English teachers' barriers to the use of computer-assisted language learning. The Internet TESL Journal 6 (12), Retrieved December 11, 2013, from http://iteslj.org/Articles/Lee-CALLbarriers.html.

Loague, A. M. (2003). Beliefs and practices regarding technology: Influences on professional instructional practices. Retrieved January 07, 2009, from ProQuest Digital Dissertations database.

Lor, P. J. & Britz, J. J. (2007). Challenges of the approaching knowledge society: Major international issues facing LIS professionals. Libri, 57(3), 111-122.

Manas University report (2009), retrieved from www.manas.kg on August 2009

Manas University Gelişmeler Raporu (2013), retrieved from www.manas.edu.tr on November 2013.

Marshall, C., & Rossman, G. B. (2006). *Designing qualitative research*. Thousands Oaks, California: Sage Publications.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: A sourcebook, 2ⁿᵈ Ed*. Thousand Oaks: Sage.

Ministry for Education, Science & Culture of the Kyrgyz Republic (2000) , retrieved November 2009 from http://www.bibl.uszeged.hu/oseas/kyrgyz_system.html

Ministry of Education of Kyrgyzstan report (2009)

Muhametjanova, G.& Çagiltay, K. "Students' and Instructors' Perceptions on Use of Information and Communication Technologies during Instruction in a Kyrgyzstan University," *2012 IEEE 12th International Conference on Advanced Learning Technologies (ICALT),* , vol., no., pp.500-502, Rome, Italy, 4-6 July 2012.

National Statistical Committee, Kyrgyz Republic (2008)

Newhouse, P. (1999). Examining how teachers adjust to the availability of portable computers. *Australian Journal of Educational Technology*, 15, 148-166.

Nicolle, P. S. Technology adoption into teaching and learning by mainstream university faculty: A mixed methodology study revealing the "how, when, why, and why not." Ph.D. thesis, Louisiana State University, 2005.

OECD and World Bank (2010). Education reform in a Kyrgyz Republic, Lessons Learned from PISA – Kyrgyz Republic.

Oppenheimer T. (2003). *The flickering mind: The false promise of technology in the classroom and how learning can be saved*. New York.

Pelgrum, W.J. (2001). Obstacles to the Integration of ICT in Education: Results from a Worldwide Educational Assessment. *Computers & Education* 37, 163- 178.

Perraton, H. (2004). Central Asia: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan; ICT use in education. Meta-survey on effective use of ICT.

Ramcharan, H. (2006). Information technology integration in higher education: A case study of a historically black university, Retrieved January 03, 2013, from ProQuest Digital Dissertations database.

Rogers, A. (1999). The origins of a global learning network, Retrieved Retrieved October 2009 from http://www.globalschoolnet.org/gsncenter/resources/articles/feb99_article.html

Scrimshaw, P. (2004). *Enabling teachers to make successful use of ICT.* British Educational Communications and Technology Agency (BECTA).

Schrum, L. (1999). Technology professional development for teachers. *Educational Technology Research and Development,* 47(4), 83-90.

Shaikh, Z., A., & Khoja, S. A. (2011). Role of ICT in shaping the future of Pakistani higher education system. The Turkish Online Journal of Educational Technology, 10(1): 149-161.

Tashakkori, A., & Teddlie C. (2003). *Handbook of mixed methods in social & behavioral research.*Sage.

Teddlie, C. & Tashakkori, A. (2009). *Foundations of Mixed Method Research*, Sage Publications.

Tempus report (2012), Higher Education in Kyrgyzstan, retrieved on October 2013 from

http://eacea.ec.europa.eu/tempus/participating_countries/overview/Kyrgyzstan.pdf

Tınmaz, H.. An assessment of preservice teachers' technology perception in relation to their subject area. MS thesis, Middle East Technical University, 2004.

Tong, K.P., and Trinidad, S.G. (2005). Conditions and Constraints of Sustainable Innovative Pedagogical Practices Using Technology. *Journal of International Electronic for Leadership in Learning,* 9(3), 1-27.

Ure, J. (2005). ICT Sector Development in Five Central Asian Economies: A Policy Framework for Effective Investment Promotion and Facilitation, a Paper for UN ESCAP.

United Nations Economic Commission for Europe (2002). *Towards a Knowledge-based Economy.* Kyrgyzstan. Country Readiness Assessment Report.

United Nations (2005). Understanding Knowledge Societies: in Twenty Questions and Answers with the Index of Knowledge Societies. New York.

Usluel, Y. K., Aşkar, P., & Baş, T. (2008). A Structural Equation Model for ICT Usage in Higher Education. *Educational Technology & Society*, *11* (2), 262-273.

Vajargah, K. F., Jahani, S. Azadmanesh, N. (2010). Application of ICT in teaching and learning at university level: The case of Shahid Beheshti university, *The Turkish Online Journal of Educational Technology*, *9* (2),33-39 .

Waxman, H. C. & Huang, S.-Y. L.(1996). Differences by level of technology use on students'motivation, anxiety, and classroom learning environment in mathematics. *Journal of Educational Technology Systems*, 25(1), 67-77.

Wheeler, M., Renchler, R., Conley, K., Summerlight, S. (2000). *National Educational Technology Standards for Students: connecting Curriculum and Technology*. ERIC.

Willis J., Thompson A., Sadera W., (1999). Research on Technology and Teacher Education: Current Status and Future Directions, *Educational Technology Research & Development*, *47*(4), 29-45.

Yıldırım, S. (2000). Effects of an educational computing course on preservice and inservice teachers: A discussion and analysis of attitudes and use. *Journal of Research on Computing in Education, 32* (4), 479-495.

APPENDIX A

THE QUESTIONNAIRE FOR INSTRUCTORS

Bu anket, Manas universitesindeki bilişim teknolojinin entegrasyonunun ders oğretimi sürecindeki ne gibi engeller ve olanakları getirdiğini belırtmek için hazırlanmıştır. Vereceginiz bilgiler sadece bilimsel arastırma amaçlı kullanılacaktır. Bu çalışma sonucunda oluşturulacak belgelerde isminiz doğrudan veya dolaylı olarak kullanılmayacaktır. Araştırma tamamlandıktan sonra bulgu ve önerilerimizi eğer isterseniz sizlerle paylaşmaktan mutluluk duyacağız. Katkılarınız için teşekkür ederiz.

1. Kişisel bilgileriniz:

a. Cinsiyetiniz: ☐ Bay ☐ Bayan

b. Fakülteniz…………………

c. E. posta adresiniz……………..

d. Bilişim teknolojileri ile ilgili hizmet içi eğitim aldınız mı? ☐ Evet ☐ Hayır

e. Bilişim teknolojileri ile ilgili örgün ve hizmet içi eğitimin dışında eğitim aldınız mı?

☐ Evet ☐ Hayır

f. <u>Eğer bir önceki soruya cevabınız evet</u> ise bunların isimlerini ve yıllarını yazınız?

…………………………………………………………………………………………………

g. Kurumunuzda kişisel kullanımınıza verilmiş bilgisayar var mı? ☐ Evet ☐ Hayır

h. <u>Eğer bir önceki soruya cevabınız evet</u> ise bu bilgisayarın İnternet bağlantısı var mı?

☐ Evet ☐ Hayır

i. Evinizde kendinize ait bilgisayarınız var mı? ☐ Evet ☐ Hayır

j. <u>Eğer bir önceki soruya "evet" cevabı verdiyseniz,</u> bu bilgisayarın İnternet bağlantısı var mı?

☐ Evet ☐ Hayır

k. Kişisel web sayfanız var mı? ☐ Evet (www………………………………) ☐ Hayır

Bilişim Teknolojilerinin Öğretimde Kullanılması:

2. Fakültenizde bilişim teknolojilerinin müfredatla bütünleştirildiğine inanıyor musunuz?

☐ Evet ☐ Kısmen ☐ Hayır

Konuyla ilgili Görüşleriniz …………………………………………………….............................

……………………………………………………………………………………………………...

3. Derslerinizde bilişim teknolojilerinden yararlanıyor musunuz? ☐ Evet ☐ Kısmen ☐ Hayır

4. Eğer bir önceki soruya "evet"" cevabı verdiyseniz derslerinizde aşağıdakilerden hangisini, ne sıklıkta kullanıyorsunuz? (Söz konusu soruya "hayır" cevabı verdiyseniz bu soruyu geçiniz)

	Donanım	Kullanım Sıklığı				
		Sürekli	Sıklıkla	Bazen	Hiç	Fikrim Yok
A	Bilgisayar					
B	Yazıcı					
C	Tarayıcı					
D	Projeksiyon Cihazı					
E	Tepegöz					
F	Video					
G	Kamera					
H	Televizyon					
İ	Teyp (Kaset çalar) cihazı					
	Diğer…………………..					

5. Aşağıdaki yazılımlar hakkındaki <u>bilgi düzeyinizi ve derslerinizde hangisini ne sıklıkla</u> kullandığınızı belirtiniz?

	Yazılım	Bilgi Düzeyi					Derste Kullanım Sıklığı				
		İleri Düzey	İyi	Orta	Acemi	Hiç	Sürekli	Sıklıkla	Bazen	Hiç	Fikrim Yok
a	Kelime İşlemci (Örn. Word)										
b	Elektronik Tablolama (Örn. Excel)										
c	Sunum Yazılımı (Örn. Power Point)										
d	Veritabanı (Örn. Access)										
e	İnternet Göz Gecdirici (Örn. İnternet Explorer)										
f	Elektronik Posta (E-mail)										
g	Sohbet Odası (Chat)										
h	Tartışma Odası (Forum)										
i	Video Konferans										

j	Eğitsel Oyunlar											
k	Benzetim (Simülasyon) Programları											
l	Öğretim Yönetim Sistemleri (WEB CT)											
m	Çizim ve Grafik Programları											
n	Animasyon Programları (Örn. Flash)											
o	İnternet Programcılığı (Örn. HTML, Java)											
p	İşletim Sistemleri (Örn. Windows, Linux)											
q	Programlama Dilleri (Örn. Visual)											
r	Referans Yazılımları (Örn. Sözlük)											
s	Diğer……… ………											

6. Çevrimiçi (online) ders veriyor musunuz? ☐ Evet ☐ Hayır

7. Derslerinizde destek amacıyla İnternet'ten yararlanıyor musunuz? ☐ Evet ☐ Kısmen ☐ Hayır

8. Eğer bir önceki soruya "evet" ya da "kısmen" cevabı verdiyseniz İnternet'ten nasıl yararlanıyorsunuz? (Söz konusu soruya "hayır" cevabı verdiyseniz bu soruyu geçiniz / **Birden fazla seçenek işaretleyebilirsiniz**).

     a. Derslerime destek amaçlı web sayfası var

     b. E.posta kullanıyorum

     c. Sohbet odası (Chat) kullanıyorum

     d. Tartışma grubu (Forum) kullanıyorum

     e. Arama motorlarını kullanıyorum

     f. Açık ders malzemeleri (Open courseware) kullanıyorum

     g. Diğer…………………………………………………………………………………

9. Aşağıda bilişim teknolojilerinin üniversite eğitimi ile bütünleştirilmesi sürecinde **karşılaşılabilecek bazı zorluklar** sıralanmıştır. Bu zorluklarla ilgili algılarınızı aşağıdaki ölçekte belirtiniz.

		Kesinlikle katılmıyorum	Katılmıyorum	Kararsızım	Katılıyorum	Kesinlikle katılıyorum
a	Donanımların (bilgisayar, yazıcı vb.) sayıca yetersizliği					
b	Donanımların kısıtlamaları (Örn. Mevcut Yazılımlarla uyumsuz, bellek yetersiz)					
c	Derslerde kullanılabilecek uygun yazılım ve diğer öğretim materyallerinin yetersizliği					
d	Akademik personelin bilişim teknolojileri hakkındaki temel bilgi ve becerisinin düzeyi					
e	Akademik personelin bilişim teknolojilerini derslerinde nasıl kullanacağına dair bilgi ve becerisinin düzeyi					
f	Bilişim teknolojileriyle ilgili hizmet içi eğitim yetersizliği					
g	Uygun olmayan ders içeriği					
h	Teknik destek yetersizliği					
i	Bilişim teknolojilerini kullanmak için yeterli zamanımın olmaması					
j	Bilişim teknolojilerini uygun biçimde yerleştirecek yeterli fiziksel ortamların olmaması					
k	Öğrencilerin (ders dışı zamanlarındaki) bilgisayar erişimlerinin sınırlı olması					

Diğer (belirtiniz)

……………………………………………………………………...........................

…………………………………………………………………………………………………

….

10. Aşağıda bilişim teknolojilerinin üniversite eğitimi ile daha iyi bütünleştirilmesi için **yapılması gerekenlere** ilişkin ifadeler yer almaktadır. Bunlarla ilgili algılarınızı aşağıdaki ölçekte belirtiniz.

		Kesinlikle katılmıyorum	Katılmıyorum	Kararsızım	Katılıyorum	Kesinlikle katılıyorum
a	Bilişim teknolojileri için daha fazla ekonomik kaynak ayırmalı					
b	Bilişim teknolojileri konusunda akademik personele yönelik *hizmet içi* eğitimin nitelik ve niceliği artırılmalı					
c	Ders içerikleri bilişim teknolojilerinden daha fazla					

		Kesinlikle katılmıyorum	Katılmıyorum	Kararsızım	Katılıyorum	Kesinlikle katılıyorum
	yararlanılacak şekilde yeniden düzenlenmeli					
d	Fakülteler bünyesinde akademik personele konuyla ilgili destek olabilecek elemanlar (teknik destek elemanı, eğitim teknoloğu vb.) tahsis edilmeli ve ilgili araç-gereçlerin daha verimli kullanımını ve paylaşımını sağlayacak (Örn. Teknolojik Kaynaklar Merkezi) birim ya da ortamlar oluşturulmalı					
e	Bilişim teknolojileri ile ilgili fakülte ve üniversite boyutunda planlar yapılmalı (eğitim ve öğretim gereksinimlerine ilişkin gelecek 3-5 yıl için öngörülen teknolojik yatırımlarla ilgili)					
f	Akademik personelin ders/iş yükü azaltılmalı					
g	Bilişim teknolojilerini bilen, derslerinde başarılı bir şekilde kullanan akademik personel desteklenmeli (ek kaynak, eğitim vb.)					
h	Derste teknoloji kullanan öğretim üyelerine teşvik verilmesi (maddi ya da donanım)					

Diğer (belirtiniz)

…………………………………………………………………….................................

………………………………………………………………………………………………….

11. Bilişim teknolojileri konusundaki bilgi ve becerilerinizi kazanmanızda **aşağıda sıralanan etkenlerden hangilerinin size katkısı olmuştur.** Bunlarla ilgili algılarınızı ölçekte belirtiniz:

		Kesinlikle katkısı olmamıştır	Katkısı olmamıştır	Kararsızım	Katkısı olmuştur	Kesinlikle katkısı olmuştur
a	üniversitede almış olduğum "bilgisayar" dersinin (Eğer öğreniminiz sırasında bu dersi almadıysanız bu satıra "–" işareti koyunuz)					
b	Almış olduğum hizmet içi eğitimlerin					
c	Almış olduğum özel dersler					
d	Ailemin ve arkadaşlarımın					
e	Bilgisayar sahibi olmamın					

		Kesinlikle katkısı olmamıştır	Katkısı olmamıştır	Karasızım	Katkısı olmuştur	Kesinlikle katkısı olmuştur
f	Çalıştığım okuldaki bilgisayar öğretmenlerinin					
g	Okulumdaki bu konuda deneyimli öğretmenlerin					
h	Konuyla ilgili formatör öğretmenlerin					
i	Kişisel merakımın					

Diğer (belirtiniz)

………………………………………………………………………….............................

………………………………………………………………………………………………….

12. Aşağıda öğretim elemanlarıyla ilgili bazı **teknolojik yeterlilikler** sıralanmıştır. Bunları inceleyerek, her biri için yeterlilik düzeyinizi belirtiniz.

		Tamamen Yetersiz	Kısmen Yetersiz	Karasızım	Kısmen Yeterli	Tamamen yeterli
a	Genel bir bilgisayar bulunan işletim sistemini kullanabilme (Windows gibi)					
b	Bilişim teknolojilerini sınıf içinde öğretime destek amacıyla kullanabilme					
c	Bilişim teknolojilerini sınıf dışında öğretime destek amacıyla kullanabilme					
d	Bilişim teknolojilerini bir dersin *uygulama* sürecinde kullanabilme					
e	Bilişim teknolojilerini bir dersin *değerlendirme* sürecinde kullanabilme					
f	Bilgisayar destekli öğretim materyallerini kullanabilme					
g	Bilgisayar destekli öğretim materyallerini değerlendirebilme					
h	Bilişim teknolojilerini mesleki gelişimi artırıcı bilgilere erişimde kullanabilme					
i	Bilişim teknolojilerini seçme ve değerlendirme					
j	Bilişim teknolojilerini müfredatla bütünleştirebilme					
k	Öğretime destek amacıyla çoklu ortam (multimedia, hipermedia) uygulamalarını kullanabilme					
l	Öğretime destek amacıyla iletişim araçlarını kullanabilme					
m	Bilgisayarları *problem çözme* amacıyla kullanabilme					
n	Bilgisayarları *veri toplama* amacıyla kullanabilme					
o	Bilgisayarları *bilgi yönetimi* amacıyla kullanabilme					
p	Bilgisayarları *iletişim kurma* amacıyla kullanabilme					
q	Bilgisayarları *karar verme* amacıyla kullanabilme					
r	Kurumsal ve kişisel amaçlar için *kelime işlemci* (Word gibi) araçları kullanabilme					
s	Kurumsal ve kişisel amaçlar için *elektronik tablolama* (Excel gibi) araçları kullanabilme					
t	Kurumsal ve kişisel amaçlar için *sunum yazılımı* (Power Point gibi) araçları kullanabilme					
u	Bilişim teknolojilerini etik ve yasal çerçevede toplum yararına kullanılması gerektiğini bilebilme					

THE QUESTIONNAIRE FOR STUDENTS

Bu anket, Manas universitesindeki bilişim teknolojinin entegrasyonunun ders öğretimi sürecindeki ne gibi engeller ve olanakları getirdiğini belırtmek için hazırlanmıştır. Vereceğiniz bilgiler sadece bilimsel araştırma amaçlı kullanılacaktır. Bu çalışma sonucunda oluşturulacak belgelerde isminiz doğrudan veya dolaylı olarak kullanılmayacaktır. Araştırma tamamlandıktan sonra bulgu ve önerilerimizi eğer isterseniz sizlerle paylaşmaktan mutluluk duyacağız. Katkılarınız için teşekkür ederiz.

Kişisel bilgiler

Cinsiyetiniz: ☐ Erkek ☐ Kadın   **Sınıfınız:**..
Bölümünüz:...   **Genel Not Ortalamanız**
                                                           (CGPA):.........................

1) Kendinize ait bilgisayarınız var mı? ☐ Evet ☐ Hayır
2) Eğer 1. soruya evet cevabı vermişseniz, bilgisayarınız ile Internet'e bağlanabiliyor musunuz?
       ☐ Evet ☐ Hayır
3) Aşağıda size verilen programların hangisinde gelecekteki mesleki yaşantınızda kullanmak üzere kendinizi yeterli hissediyorsunuz:

	Zayıf	Orta	İyi
a. Bilgisayarla ilgili temel kavramlar			
b. Bilgisayarın fiziksel parçaları (donanım)			
c. İşletim Sistemi (Ör: Windows)			
d. Kelime İşlemci Programlar (Ör: Word)			
e. Hesaplama Tablosu Programları (Ör: Excel)			
f. Sunum Programları (Ör: Powerpoint)			

4) Aşağıdakı soruları cevaplandırırken **birden fazla seçenek işaretleyebilirsiniz**.

Şıklarda size sunulan seçenekler haricindeki cevaplarınızı "**Diğer"** alanına yazabilirsiniz.

1. Öğretim elemanları derslerde.. dersleri hiç kaçırmazdım.

   ☐ Düzenli olarak hand-out (çalışma yaprağı) dağıtsa
   ☐ Projeksiyon cihazı ile ders içeriğini yansıtsa
   ☐ Simülasyonlarla dersi zenginleştirse
   ☐ Konuyla ilgili video izletse
   ☐ Diğer : ....

2. Öğretim elemanlarının ....daha iyi öğrenmeme yardımcı olur.

   ☐ Ders dışında öğrencilerle e-posta, forum ile iletişim kurması
   ☐ Ders notlarının, kaynaklarının bulunduğu web sayfası sağlaması
   ☐ Simülasyonlar üzerinde uygulama yapma olanağı sağlaması
   ☐ Dersleri online (e-öğrenme ile) işlemesi

☐ Diğer : ....

3. Öğretim elemanlarının derslerde en sık kullandıkları <u>teknolojiler</u> nelerdir?

☐ Basılı materyal
☐ Tepegöz/ Projektör
☐ Video/ VCD/ DVD
☐ Bilgisayar (Bilgisayar/Internet)
☐ Internet
☐ Karatahta/tebeşir
☐ Diğer : ....

4. Sınıf dışında öğretim amaçlı olarak aşağıdaki <u>teknolojilerden</u> hangilerini kullanıyorsunuz?

☐ Basılı materyal
☐ Bilgisayar
☐ Internet
☐ Chat ve forum ortamları(MSN ve Yahoo Messenger)
☐ Cep telefonu (SMS / MMS)
☐ Ses kayıt cihazı
☐ Diğer : ....

5. Öğretim elemanlarının derslerde teknolojiyi daha fazla kullanması……………………………….

☐ Konuları daha iyi kavramamı sağlar
☐ Derse daha iyi motive olmamı sağlar
☐ Aldığım eğitimin kalitesini/ etkinliğini artırır.
☐ Öğrendiklerimin daha kalıcı olmasını sağlar.
☐ Bana herhangi bir katkı sağlamaz.
☐ Diğer : ....

6. Derslerde teknoloji kullanımında gözlemlediğim en büyük sorun(lar)
    ....

☐ Öğretim elemanlarının bu konudaki bilgi ve tecrübe eksikliğidir
☐ Donanım eksikliğidir
☐ Yazılım eksikliğidir
☐ Teknik personel eksikliğidir
☐ Sınıf – laboratuar koşullarının yetersizliğidir
☐ Diğer : ....

7. Eğitim öğretim açısından bakıldığında çağdaş üniversitede mutlaka
    ....

☐ Dersler online (e-öğrenme ile) verilmelidir.
☐ Ders içeriğine ve ek kaynaklara online olarak ulaşılabilmelidir.
☐ Öğretim elemanlarına öğrenciler sanal ortamda da kolaylıkla erişebilmelidir (msn, e-posta, forum vs.)
☐ Dijital kütüphane olanakları sağlanmalıdır.
☐ Derslerin video/ses kayıtları yapılmalı ve bunlara daha sonra ulaşılabilmelidir.
☐ Diğer : ....

8. Kazandığınız zaman hayal ettiğiniz ve şu an eğitim aldığınız KTMÜ'yü, eğitim öğretimde teknoloji kullanımı açısından karşılaştırır mısınız? Beklentilerinizi karşıladı mı, eksik yanları nelerdir?

9. KTMÜ eğitime teknoloji entegrasyonu konusunda ne yapmalıdır ki, öğrenciler KTMÜ' de eğitim alıyor olmayı bir ayrıcalık olarak görsün?

Genel Durum

		Kesinlikle katılmıyorum	Katılmıyorum	Karasızım	Katılıyorum	Kesinlikle katılıyorum
Teknolojinin derse olan ilgiye etkisi	Teknoloji kullanılan derslere daha çok zaman ayırıyorum.					
	Öğretim elemanının teknoloji kullanması konuya olan ilgimi daha çok arttırıyor.					
Teknolojinin başarıya etkisi	Sınıfta teknoloji kullanımı beklentilerimi karşıladı.					
	Bilgi teknolojisi kullanılan derslerde daha iyi notlar elde ettim.					
Bilgi teknolojisi kullanma	Bilgi teknolojilerinin esas olarak bilginin sunumunu geliştirmede kullanılması etkilidir.					
	Bilgi teknolojileri karmaşık ve soyut kavramların anlaşılmasında yardımcı olur.					
Teknolojinin iletişim üzerindeki etkileri	Öğretim elemanıyla olan iletişimimi arttırdı.					
	Sınıf arkadaşlarımla olan iletişimimi arttırdı.					
Teknolojinin öğrenme üzerindeki etkileri	Bilgi teknolojileri sayesinde öğretim elemanından anında geribildirim alabildim.					
	Bilgi teknolojileri ders materyallerine daha çok destek ve uygulama imkanı sağlar.					
Bilgi teknolojisi kullanılan derslerde;	Gerçek hayattaki meselelere(konulara) daha çok odaklanılır.					
	Sınıf içi aktivitelerde öğrencilere daha fazla kontrol sağlanır.					
Aşağıdaki cümleler ders deneyimlerinizi tanımlamada ne kadar etkilidir?						
Derste bilgisayar kullanımı, geleneksel öğretim metodlarına göre avantaj sunar.						
Bilgisayar teknolojisi öğrenmenin kalitesini iyileştiremez.						
Sınıfta bilgisayar teknolojisinin kullanılması konuyu daha ilginç kılar.						

	Kesinlikle katılmıyorum	Katılmıyorum	Kararsızım	Katılıyorum	Kesinlikle katılıyorum
Bilgisayarların okulda yeri yoktur.					
Bilgisarın eğitim aracı olarak kullanıldığını daha önce hiç görmedim.					
Bazı öğretim elemanları derste bilgisayarı eğitim aracı olarak kullanmaktadır.					
Genellikle, öğrenmede teknoloji kullanımı çok zaman kaybettirir.					
Eğitmen ile iyi etkileşim yüzyüze iletişim gerektirir.					
Bilgi teknolojilerinin öğrenme deneyimimi geliştireceğine inanıyorum					
Derste bilgi teknolojilerinin kullanılması deneyimlerin etkili şekilde paylaşılmasını sağlar.					
Geleneksel (sadece yüzyüze) öğretim metodlarıyla öğrenmeyi tercih ederim.					

Derslerde bilgi teknolojisi kullanmanın aşağıda sayılan yararlarından hangisi sizin için en değerlisidir? 1'den 5'e kadar sıralayınız.	
Öğrenmemi geliştirir	
Zaman kazandırır	
Ders aktivitelerimi düzenlemede yardımı olur (planlama, zamanı bölüştürme vb.)	
Uygunluk/ rahatlık	
Hiç yararı olmaz	
Diğer (lütfen tanımlayınız)	

Sınıf içinde bilgisayar ya da diğer bilgi teknolojilerini kullanırken karşılaştığınız engeller nelerdir? (**uygun olanlara X işareti ekleyiniz.**)	
Dersle bağlantısı (ilişkisi) az olan bir sürü ekstra görev verilmiş gibi hissediyorum.	
Gerekli teknik becerilere sahip değilim.	
İhtiyacım olan teknik desteğe sahip değilim.	
Çok pahalı.	
Bir bilgisayara yeterli erişim olanağım yok.	
Uygulamalar bilgisayarımda çalışmıyor.	
Internete bağlanmada sorun yaşıyorum. (güvenilir internet bağlantım yok)	

Hiç engel yok.	
Diğer (lütfen tanımlayınız)	
Aşağıdakilerden hangisi teknoloji kullanımına göre ders seçimlerinizdeki tercihlerinizi en iyi tanımlar? (X) **Birden fazla seçenek işaretleyebilirsiniz.**	
Hiç teknoloji kullanılmayan dersleri tercih ederim.	
Sınırlı seviyede teknolojik özellikler kullanılan dersleri tercih ederim. (öğretim elemanlarına e-mail gönderme, sınıfta sınırlı seviyede Powerpoint kullanımı)	
Orta seviyede teknoloji kullanılan dersleri tercih ederim. (e-mail, Powerpoint sunuları, online aktiviteler ve içerik)	
Yaygın bir şekilde teknoloji kullanılan dersleri tercih ederim.(online ders notları, simülasyonlar, Poweroint sunuları, görüntülü ve sesli materyal kullanımı vb.)	
Tamamen online olarak verilen ve hiç yüz yüze etkileşim gerektirmeyen dersleri tercih ederim.	

Nasıl olmalıdır?

	Kesinlikle katılmıyorum	Katılmıyorum	Karasızım	Katılıyorum	Kesinlikle katılıyorum
Öğrencilerin derslerinde teknolojiyi kullanmasını sağlamak için daha fazla olanak sağlanmalıdır.					
Her dersin bir web sitesi olmalıdır.					
Eğitmenlerin derslerde teknolojiyi daha fazla kullanmaları desteklenmelidir.					
Eğitmenlerin derste teknoloji kullanmaları değerlendirilmelidir.					
Ders notlarına online ulaşılabilmedir.					
Tüm derslerin syllabus'ları online ortamda ve güncel olarak yer almalıdır.					
Dersler beni kariyer alanımda teknoloji kullanımına hazırlıyor.					
Eğitmenlerim öğretim teknolojilerini öğretimde iletişim ve anlatım için kullanmada yetkinler.					

APPENDIX C

INTERVIEW QUOTATIONS

1) "Esli vse kompyuteri poschitat, na 5 chelovek odin kompyuter prihoditsa dlya studentov, no nemnogo ne tak tochno, potomu chto v schet idut kompyuteri prepodov, oni nedostupni studentam. U nas na fakultee net kompyuternogo klassa"

2) "Namnogo lutshe chem v drugih universitetah, no nedostatok proektorov, na odin fakultet tolko odin proektor, eto ochen malo"

3) "Fotokopi makinalarin her fakultede olmasi, bir de mesela yazicilarin tamirinin zamaninda yapilmasi gibi konularda iste teknik destek olmasi onemli olmaktadir"

4) "Ponimaete, ya doljna znat bolshe chem student, no dlya etogo s nami nado rabotat, s prepodavatelyami, a zdes poluchaetsa naoborot student bolshe znaet, ya u nego sprashivayu, a kak je vot zdes, a rebyata? nado je vot eto otkrit,da? Ponimaete, tak daje ne krasivo, ne ubodno, u menya daje kompleks v etom plane."

5) "Hizmet içi eğitim yok, yani ne diyeyim, herkes kendi başına ve arkadaşına: - Sen biliyor musun, bana yardımcı ol diye"

6) "Mesela bizde en önemli sıkıntı bu araçları kurma noktasında hazır sınıflar yok. Bunları ders öncesi kurup anlatıp ders bittikten sonra toplayıp teslim etmemiz lazım" .... "Bunun için ders öncesi kurup onları sökme sorunu var zaman alıyor. Bunlardan teknik personel yetersiz mesela hocalar kendi başlarına kalıyorlar"

7) "Кыргызкий язык не развит не только в области компьютерных технологий, но вообще у нас не хватает литературы, даже в магазинах у нас на кыргызком не говорят, а мы хотим,чтобы тут на кыргызком изучали компьютерные технологии. Литературы нет, поэтому студенты все ограниченными становятся, приходится им брать литературу то тут, то там немного, но все равно не хватает. Но студенты мучаются, слушают на кыргызком языке, потом приходят на русском читают, потом на кыргызком, потом на турецком. Люди тут забывают кыргызкий язык, на турецком говорят".

8) "In the summer the speed of the internet is becoming lower which decrease the performance. We are trying to prepare the lectures for the fall semester during the summer, but due to the low speed of the internet we spend more time to search and download some information. Moreover, there is a limitation to view videos. There should be no limits for instructors and the speed of the internet should be higher. However, this limit can be applied for administrative, but not academic stuff"

9) "Esli bi prepodavateli polutshe uchili Excel, nam ekonomistam bilo bi namnogo legche, to est bole uglublenno, oni prosto ne hotyat. Sami prepodavateli ochen hotyat obyasnit, no bolshinstvo ne znayu ya ne imeyut kompyutera, ne imeli I ne videli. Oni prosto propuskayut eto, govoryat, da eto mojno poschitat v Excel, no mi hoteli bi,chtobi pokazali kak. Ya dumayu otdalennost nas ot kompyutera, net voobshe kompyuterov, esli bi kakoy-nibud urok prepodavalsa v labe, bili bi horosho. Na proektore pokazivayut, u nas pod rukoy net lektsii, prosto chitaem eto i vse. Hotya bi minimum mogli bi preposdavit kompyuterniy klass, so stolko do stolki to, takogo daje net. "

10) "Başka üniversitelere göre bizde yeterli diye düsünüyorum. Böyle şartlar yok: internet var; lablar var, oraya gidip biz bedava kullanabiliyoruz."

11) "Nu po sravneniyu s drugimi universitetami, u nas dostatochno. Vse obespechiaetsa, tolko nado uchitsa. V objeshijii toje internet salon est, kinozal est, ostaetsa nam tolko uchitsa."

12) "Nu sravnitelno s drugimi universitemami mne kajetsa, chto u nas samaya lutshaya baza v Kirgizstane, potomu chto u nas ispolzuetsa proektori, notebooki, vo mnogih drugih universitetah ne ispolzuyutsa. Oni vse pishut na doske lektsiyu. A u nas vse eto bolle ili menee lutshe. No vse taki jelatelno, hochetsa pojelat,chtobi eshe lutshe bilo, potomu chto ya viju kak za rubejom, vot v Turtsii, tam eshe bolshe drugie tehnologii ispolzuyutsa, laboratorii v kotorih hvataet kompyuterov. A u nas vot naprimer ne hvataet kompyuterov kogda mi v laboratorii."

13) "U nas net laboratoriy, esli bi nam skazali, vot est lab vi mojete zahodit so stolko do stolki chasov, esli bi eto bilo sistematizirovanno. Esli u tebya net notebook, eto tvoi problemi, net vozmojnosti polzovatsa labami, nichem"

14) "Benim kendi laptobum var orada odevleri yapıyorum ama bazı öğrenciler var ki kendi evinde kendine ait bilgisayarı yok, ikinciden de 2-3 tane lab var bizim

bölümden, o yerlerde de sabahtan akşama kadar ders var. Ders bitince de saat 5ten sonra lab kapanıyor ve bazen bizim boş olduğumuz zaman lab boş değil".

15) "Pri souze bili kursi povisheniya kvalifikatsii, kajdie 4 goda obyazani bili proyti ih. Ya posledniy raz bil v 1998 godu, universitet otpravlyal na pol goda ili na smestr v Moskvu, za eti polgoda gotovilsa, uchilsa novomu predmetu. Zdes takogo net I ne bilo."

16) "Teknoloji kullananlara motivasyon olması için anonym anket üzerinde öğretmen ne kadar teknoloji kullanıyor. Eğer o öğretmen 5 alıyorsa o sorudan ona göre maaş olsa öğretmenin, o zaman daha iyi çalışır. Genel değerlendirmeye o soru eklense daha iyi olur. O anket yıllık yapılıyor ama bir değişiklik yok, fakültede de bölümlerde de bir şey denmiyor. İşte evaluationa göre maaş olsa o zaman motivasyon olur "

17) Большинство уроков в нашем отделении преподаются на Кыргызком языке, и всего лишь несколько преподавателей преподают на турецком. Студенты жалуются и говорят, что хотят чтобы лекции были на турецком. Кроме того, система образования давно устарела. Это Советская система, которая не может применяться сейчас. Мы должны изменить эту систему и начать использовать современную систему взамен старой. Однако, большая часть преподавателей в некоторых отделениях очень старые, и из-за их возраста они не хотят и не могут использовать современную систему или даже компьютеры.

18) "Ya dumayu esli bi kajdiy prepodavatel podgotovil svoy predmet v elektronnom vide I esli u nego bila bi uverennost, chto on eshe budet vesti etot predmet, on bi staralsa. A esli zavtra drugoy budet chitat lectsiyu, togda net, on ne motivirovan"

19) "Mesela projector az oldugu icin ogretmenlere her derste yetmeyebilir. Yarisi biliyor,yarisi da bilmiyor hic nasil bilgisayarlari derslerde entegre edebiliriz. Genc ogretmenler daha iyi biliyorlar ve onceki Sovyet donemindekiler hic bilmiyorlar diyebilirim. Ogrenmek istemiyorlar. Teknik destek de yeterli degil, hocalar kendi basina ogreniyorlar. Yasli ogretmenler icin burda kurslar aciliyor da ama yasli ogretmenler kendileri gitmiyorlar. Her donem basinda aciliyor, ama onlar gitmedikleri icin o kursa, onlar zorunlu degil"

20) Мы видим разницу в преподавании между преподавателями, которые работают на пол ставки и приходят к нам с других университетов. У них нет

здесь своего кабинета и компьютера, и доступа в интернет в университете. Их учебный материал очень старый, они дают нам литературу и мы видим,что она старая. У них нет доступа к новой информации и это огорчает. У них недостаток знаний и опыта как использовать технологию, и они видят, что могут использовать технологию здесь. Но те, кто работает на полную ставку они проходят с готовым материалом или со слайд шоу Powerpoint, и они используют новые пособия.

21) "Наш век - это информационный век и за счёт этого мы должны владеть большей информацией, чем наши предки, наши родители, которые жили и учились. И мне кажется, что вообще владение этой технологией дает нам шанс быть более продвинутыми, узнавать больше, быть профессионалами в своей области."

22) "Сейчас большинство людей не читают книг, они проводят больше времени в интернете. Большую часть своего времени они проводят на разных сайтах и особенно в социальных сетях"

INTERVIEW GUIDE FOR INSTRUCTORS (TURKISH VERSION)

Merhaba,
Ben Gulshat Muhametjanova, ODTU Egitim Fakultesi, Bilgisayar ve Ogretim Teknolojileri Egitimi Bolumunde Doktora ogrencisiyim.

Oncelikle, gorusmeyi Kabul ettiginiz icin tesekkur ederim. Bu calismada, Bilisim teknolojinin ogretim surecine ne gibi engeller ve olanaklar getirdigini arastiriyorum. Bu konuda sizin bilgi ve tecrubelerinizden faydalanmak istiyorum.

Kisisel bilgileriniz ve cevaplariniz kesinlikle gizli tutulacak, sadece bu arastirma icin kullanilacak ve arastirma sonunda toplu halde sunulacaktir.Arastirma sonuclandiginda size bilgi verilecektir. Butun bu aciklamalardan sonra verdiginiz bilgilerin arastirmamda kullanilmasina ve gorusmeyi kaydetmeme izin verir misiniz?

O halde ilk soruya baslayalim.
1. Alanınız, branşınız nedir?
2. Kaç yildir ders veriyorsunuz?
3. Teknolojik arac gerecleri derslerinize entegre etmekten ne anlıyorsunuz?
4. Derslerinizde hangi teknolojik arac gereclerden ve ne sıklıkla yararlanıyorsunuz?
5. Teknolojik arac gerecleri öğretimde nasil kullaniyorsunuz? Bu teknolojiyi daha iyi kullanma konusunda yetersiz kaldiginiz ve daha iyi ogrenmek istediginiz seyler var mi, nelerdir?
6. Ogretim surecinde teknolojik arac gereclerinin kullaniminin ogrenme ve ogretme uzerinde ne gibi etkileri oldugunu dusunuyorsunuz?
a. Olumlu ise nelerdir? Olumsuz ise nelerdir?
b. Teknolojik arac gereclerinin kullaniminin ogrenme ve ogretme suresi uzerinde ne gibi olanaklar getirdiğini düşünüyorsunuz?
7. Universitenizde teknolojik altyapi arac gerec sayisi yeterli mi?(ogretim uyeleri, ogrenciler icin) Yeterli degilse: Daha baska ne tur kaynaklara ihtiyac var sizce?
a. Hayir ise sebepleri nedir?
8. Universitenizde teknolojik kaynaklar öğretim sürecinde kullanimini engelleyen zorluklar (sorunlar) var mı?
a. *Clue: hizmet ici egitim yetersizligi, donanim, bilgi ve beceri yetersizligi, teknik destek yetersizligi (ogretim uyeleri tarafindan kullanmak icin, ogrenciler tarafindan kullanmak icin*) Varsa nelerdir? Neden?

     b. Sorunlari onlemek icin neler yapilmali?

9. Universitenizde teknolojik kaynakların kullanımını teşvik edici ne tür destekler sağlanıyor? (teknik)

10. Teknolojik arac gereclerin öğretim sürecinde daha etkin bir sekilde kullanabilmesi icin sizce neler yapilmali? (Ogretmenler, ogrenciler, administation tarafindan)

     a. *Clue: daha fazla ekonomik kaynak ayrilmali, hizmet ici egitim nitelik ve niceligi artirilmali, ders icerikleri yeniden duzenlenmeli)*

APPENDIX E

INTERVIEW GUIDE FOR INSTRUCTORS (RUSSIAN VERSION)

Zdravstvuyte,menya zovut Gulshat Muhametjanova, ya studentka doktorantka v METU universitete na fakultete pedagogiki,otdelenie Kompyuter I Obrazovatelnie Tehnoligii.

V pervuyu cohered, hotela bi vas poblagodarit za to,chto soglasilis prinyat uchastie. V etoy rabote ya issleduyu baryeri I vozmojnosti, predostavlennie kompyuternimi tehnologiyami v protsesse obucheniya. Ya bi hotela uznat I vashe mnenie I opit po etoy teme.

Vse dannie I otveti budut derjat v secrete I ispolzovatsa tolko v isseldovatelskih tselyah etoy raboti I po zaversheniyu predstavleni v obshem. Posle zaversheniya raboti ti budete proinformirovani. Posle vsego skazannogo vi pozvolite mne ispolzovat Dannie vami otveti dlya moego issledovaniya?

Togda davayte pereydem k pervomu voprosu?

1. Vasha professiya, sfera deyatelnosti?
2. Skolko let vi prepodayete?
3. Chto vi ponimaete pod integrirovaniem kompyuternih tehnologiy vo vremya urokov, obucheniya?
4. Kakie tehnologii i kak chasto vi ispolzuete vo vremya urokov, obucheniya?
5. Kak vi ispolzuete kompyuternie tehnologii v protsesse obucheniya? Est' li kakaya-libo iz etih tehnologiy, kotoroy vi bi hoteli bolshe obuchitsa i chuvstvuete sebya nedostatochno kvalifitsirovannim? Esli est,kakaya?
   a. Kak vi dumaete kakie vozmojnosti predostavlyaet nam kompyuternaya tehnologiya?

6. Kak vi dumaete kakoi effect ot ispolzovaniya kompyuternih tehnologiy v protsesse obucheniya na obuchaemost i prepodavanie?
   a. Esli polojitelniy, to kakoi? Esli otritsatelniy, to kakoy?
   b. Chto nujno sdelat, chtobi prepotvratit negativniy effekt,problemi?
7. Dostatochnaya li v vashem universitete tehnologicheskaya baza? (dlya prepodavateley, dlya studentov) Esli nedostatochno: Kak vi dumaete, kakie eshe resursi neobhodimi?
   a. Esli net, to v chem prichini?
8. Est li baryeri (problemi) v universitete, meshayushie ispolzovaniyu kompyuternih tehnologiy v protsesse obucheniya? Esli est', kakie? Pochemu?
   a. Clue: Nedostatochno obrazovaniya, svyazannogo s komp teh-yami, oborudovanie, nehvatka znaniy i umeniya ispolzovat komp.teh., nehvatka pomoshi tehnichesnkogo personala.

9. Kakogo roda podderjka osushestvlyaetsa universitetom dlya pooshreniya ispolzovaniya kompyuternih tehnologiy v universitete? (tehnicheskaya)

10. Kak vi dumaete, chto doljno bit sdelano (So storoni prepodavateley, studentov, administratsii) dlya bolee effektivnogo ispolzovaniya kompyuternih tehnologiy v protsesse obucheniya?

Clue: (Doljno bit videleno bolshe ekonomicheskih resursov, dojno bit povisheno kolichestvo i kachestvo obrazovaniya, soderjanie urokov doljno bit zanovo sozdano)

INTERVIEW GUIDE FOR STUDENTS (TURKISH VERSION)

Merhaba,
Ben Gulshat Muhametjanova, ODTU Egitim Fakultesi, Bilgisayar ve Ogretim Teknolojileri Egitimi Bolumunde Doktora ogrencisiyim.

Oncelikle, gorusmeyi Kabul ettiginiz icin tesekkur ederim. Bu calismada, Bilisim teknolojinin ogretim surecine ne gibi engeller ve olanaklar getirdigini arastiriyorum. Bu konuda sizin bilgi ve tecrubelerinizden faydalanmak istiyorum.

Kisisel bilgileriniz ve cevaplariniz kesinlikle gizli tutulacak, sadece bu arastirma icin kullanilacak ve arastirma sonunda toplu halde sunulacaktir.Arastirma sonuclandiginda size bilgi verilecektir. Butun bu aciklamalardan sonra verdiginiz bilgilerin arastirmamda kullanilmasina izin verir misiniz?

O halde ilk soruya baslayalim.

1. Bölümünüz nedir?
2. Kaçıncı sınıfta okuyorsunuz?
3. Ogretim surecinde (sinif icinde, disinda) hangi teknolojik arac gereclerinden ve ne sıklıkla ve nasil yararlanıyorsunuz?
   a. (Bilgisayar, internet, chat ve forum – msn, yahoo, cep telefonu – sms, mms) Ne icin kullaniyorsunuz?
4. Ogretim surecinde teknolojik arac gereclerin kullaniminin ogrenme ve ogretme suresi uzerinde ne gibi etkileri oldugunu dusunuyorsunuz?
   a. Olumlu ise nelerdir?
   b. Olumsuz ise nelerdir?
5. Universitenizde teknolojik arac gerec ve kaynaklar yeterli mi?(ogretim uyeleri, ogrenciler icin). Daha baska ne tur kaynaklara ihtiyac var sizce?
6. Universitenizde teknolojik arac gereclerin öğretim sürecinde kullanimini engelleyen zorluklar (sorunlar) var mı?
   a. Varsa nelerdir? *Clue: donanim, bilgi ve beceri yetersizligi, teknik destek yetersizligi.*
   b. Neden? Sorunlari onlemek icin neler yapilmali?
7. Universitenizde teknolojik arac gereclerin öğretim sürecinde kullanimini engelleyen zorluklar (sorunlar) var mı?

a. Varsa nelerdir? *Clue: donanim, bilgi ve beceri yetersizligi, teknik destek yetersizligi.*
b. Neden? Sorunlari onlemek icin neler yapilmali?
   8. Teknolojik arac gereclerin öğretim sürecinde daha etkin bir sekilde kullanabilmesi icin sizce neler yapilmali?

a. (Ogretmenler, ogrenciler, administation tarafindan) *Clue: daha fazla ekonomik kaynak ayrilmali, her sitenin web sitesi olmali, egitim, ders icerikleri online ulasabilmelidir)*

INTERVIEW GUIDE FOR STUDENTS (RUSSIAN VERSION)

Zdravstvuyte,menya zovut Gulshat Muhametjanova, ya studentka doktorantka v
METU universitete na fakultete pedagogiki,otdelenie Kompyuter I Obrazovatelnie
Tehnoligii.
V pervuyu cohered, hotela bi vas poblagodarit za to,chto soglasilis prinyat uchastie.
V etoy rabote ya issleduyu baryeri I vozmojnosti, predostavlennie kompyuternimi
tehnologiyami v protsesse obucheniya. Ya bi hotela uznat I vashe mnenie I opit po
etoy teme.
Vse dannie I otveti budut derjat v secrete I ispolzovatsa tolko v isseldovatelskih
tselyah etoy raboti I po zaversheniyu predstavleni v obshem. Posle zaversheniya
raboti ti budete proinformirovani. Posle vsego skazannogo vi pozvolite mne
ispolzovat Dannie vami otveti dlya moego issledovaniya?
Togda davayte pereydem k pervomu voprosu?

1. Vashe otdelenie?

2. Na kakom vi kurse uchites?

3. Kakie kompyuternie tehnologii I kak chaste vi ispolzuete v
   protsesse obucheniya (vo vremya urokov I vne urokov)?

a. Kompyuter, internet, chat I forum – msn, yahoo, sotoviy telefon – sms,
   mms. Dlya chego ispolzuete I kak?

4. Kak vi dumaete kakoi effect ot ispolzovaniya kompyuternih
   tehnologiy v protsesse obucheniya na obuchaemost i
   prepodavanie?

   a. Esli polojitelniy, to kakoi? Esli otritsatelniy, to kakoy?

5. Dostatochnaya li v vashem universitete tehnologicheskaya
   baza? (dlya prepodavateley, dlya studentov) Esli
   nedostatochno: Kak vi dumaete, kakie eshe resursi
   neobhodimi?

6. Est li baryeri (problemi) v universitete, meshayushie
   ispolzovaniyu kompyuternih tehnologiy v protsesse
   obucheniya?

a. Esli est', kakie? Pochemu? Clue: Nedostatochno obrazovaniya,
   svyazannogo s komp teh-yami, oborudovanie.

7. Pochemu i Chto doljno bit sdelano dlya predotvrasheniya etih
   problem?

Teknolojik arac gereclerin öğretim sürecinde daha etkin bir sekilde
kullanabilmesi icin sizce neler yapilmali? Chto doljno

b. Doljno bit videleno bolshe ekonomicheskih resursov, u kajdogo predmeta doljen bit svoi sait, obrazovanie, soderjanie urokov doljno bit dostupno online.

CURRICULUM VITAE

PERSONAL INFORMATION

Surname, Name: Gulshat, Muhametjanova

Nationality: Kyrgyzstan

Date and Place of Birth: 14 April 1982, Bishkek

Marital Status: Married

Phone: +90 555 669 47 22

Email: gulshatka@gmail.com

EDUCATION

Degree	Institution	Year of Graduation
BS	KTMU Computer Engineering	2004

FOREIGN LANGUAGES

Advanced English, Fluent Russian, Fluent Turkish, Advanced Kyrgyz, Basic German

PUBLICATIONS

1.   Muhametjanova, G. & Çagıltay, K. Students' Expectation on Use of Information and Communication Technologies during Instruction in a Kyrgyzstan University. *The European Conference on Educational Research (ECER),* Cadiz, Spain*,*   September 17-18, 2012

2.   Muhametjanova, G.& Çagiltay, K. "Students' and Instructors' Perceptions on Use of Information and Communication Technologies during Instruction in a Kyrgyzstan University," *2012 IEEE 12th International Conference on Advanced Learning Technologies (ICALT),* , vol., no., pp.500-502, Rome, Italy, 4-6 July 2012.

3.   Leyendecker, B., Agache, A., Ozdemir A. A., Jakel, J., Kohl K., Muhametjanova, G., Spiegler, O., & Willard, J. Feeling at home in two countries?

Adaptation of immigrant children in Germany. *Third Norface Workshop in migration,* Mannheim, March 29-31, 2012.

4.   Muhametjanova, G. & Çagıltay, K. Investigating the Faculty Members' Information and Communication Technologies (ICT) integration into instruction in a Kyrgyzstan University. *The European Conference on Educational Research (ECER)*, Berlin, Germany, September 12-16, 2011.

5.   Muhametjanova, G. & Cagiltay, K. (2011). Instructors' Perceptions regarding Information and Communication Technologies Integration into Instruction in a Kyrgyzstan University: a case study. In T. Bastiaens & M. Ebner (Eds.), *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2011* (*EDMEDIA),* (pp. 225-231). Chesapeake, VA: AACE, June 27-July 1, Lisbon, Portugal.

6.   Muhametjanova, G., Cagiltay, K., Kara, A.G. & Akimaliev, M. (2011). Using online social networking: Graduate students' gender differences in using facebook. In T. Bastiaens & M. Ebner (Eds.), *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2011* (*EDMEDIA),* (pp. 821-825). Chesapeake, VA: AACE, June 27–July 1, Lisbon, Portugal.

7.   Muhametjanova, G. & Çagıltay, K. Barriers and Enablers of Technology Integration into Instruction in a Kyrgyzstan University: A Case Study, *Association for Educational Communications and Technology (AECT*). Anaheim, CA, USA. October 26-30, 2010.