II. E-LEARNING AND INTERCULTURAL COMPETENCES DEVELOPMENT IN DIFFERENT COUNTRIES

ICT EDUCATION IN TURKEY: NATIONAL ICT CURRICULUM TO IMPROVE TEACHING AND LEARNING

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Abstract: ICT becomes more and more important concern for educational institutions and governments for increasing the quality of teaching and learning. Ministry of Education (MoNE) in Turkey aims to be part of this. Policy makers in MoNE initiated a new project called FATIH. This project defines the role of ICT and integrates it at levels and education so that teachers and students can take advantage of ICT. This paper presents the current situation in Turkey and present some research findings related to FATIH project.

Keywords: informatics education, ICT curriculum, teacher training

INTRODUCTION

The common thought about ICT is having an impact on our world (Bownell, 1997; Widmer & Amburgery, 1994; Barker 1993) as well as on education (Bates & Poole 2003). Governments already spend billions of US dollars each year on their education systems. All of them are looking for more effective, efficient and consistent education systems. They all accept the role of technology in this view. "To be a country that has become a focal point in the production of science and technology, that uses information and technology as an effective tool, that produces

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more value with information- based decision-making processes and that is successful in global competition, with a high level of welfare." (Information Society Strategy, 2006)

There are many suggestions for implementing technology into teacher education programs, mandates and guidelines conceived by professional organizations, state boards of education and experienced educators (Widmer & Amburgery: 1994). Indeed, what is important is to provide student teachers with technology integrated teacher education programs so that they will be able to use technology once they become in-field teachers (Bownell 1997).

ABOUT TURKEY

Turkey is a country with a physical and cultural bridge between Europe and Asia. It has a total area of about 780 km^2. With a population of 75 million and nearly 17 million students and 800,000 teachers. Children between 0 and 14 age group constituted 29.8 % of this estimated population. Population between 14 and 64 age group constituted 65 % and above 64 age group constituted 6 % of population. The primary and secondary education is mandatory education which is divided to 4+4+4 years in 2014 for children aged between 6 and 18 age groups. According to MoNE (2014), primary education institutions consist of four-year and compulsory lower secondary schools, four-year and compulsory lower secondary schools which give opportunity to allow for different programs, and lower secondary schools for imams (person who lead prayers and Islamic obligatory practices) and preachers.

After the students have graduated from secondary schools, they have to take the university entrance examination to be get acceptance for a university. There is a great competition for entry into the 193 public and private universities. Due to the characteristics of educational system, Information Communication Technology is a rational option to increase an overall education level in Turkey.

ICT PROJECTS IN TURKEY

Turkey has made many efforts for increasing the quality of education and reducing educational inequality across lines of gender and socioeconomic background (World Bank, 2013). One of them is Basic Education Project which aims to provide public schools with access to computing equipment and interactive teaching technologies. The last one that is FATIH project which is Movement to Increase Opportunities and Improve Technology was started in 2009.

Basic Education Project:

In the first project which is World Bank supported Basic Education Project implemented between 1998 and 2004, the aim was to improve basic education quality by providing computer labs and educational materials to schools. Within the

scope of the project, computer equipment was provided to 2,802 classrooms and ICT trainers and coordinators were trained.

While the project was ongoing, a lot of effort was made to overcome the difficulties of integration in educational settings and educate the pre-service teachers in usage of technology (MoNE, 2007). After completing the project, many research results proved that insufficient computer software was provided to schools; actual courses taught by ICT trainers were limited to laboratories and focused on basic computer skills. According to the World Bank report (2004), subject teachers were not trained in how to integrate computers into their subject teaching in this project.

Fatih Project:

FATIH, which means Movement of Enhancing Opportunities and Improving Technology, is among the most outstanding educational investments of Turkey. The Ministry of National Education has designed projects to provide Interactive White Boards, tablet computers and Internet network infrastructure to all schools in basic education in an attempt to enhance equality of opportunity in education and to improve ICT use in teaching and learning processes in schools. The scope of this project is that "Smart Class" project is put into practice in all schools in Turkey. With this project, 42,000 schools and 570,000 classes will be equipped with the latest information technologies and will be transformed into computerized classes (Smart Class).

In the official website of FATIH, The project, which was initially launched in secondary schools and is continuing for all grade levels between 2011 and 2019, has expressed five main components.

1. Providing Equipment and Software Substructure: the first step is preparation of the infrastructure for hardware and software that comprises effective procurement, distribution and technical set-up of equipment in schools.

2. Providing Educational e-content and Management of e-content: in order to enable ICT-supported instruction, providing and administering of the e-content that entails creating new class materials consistent is going to be a crucial step.

3. Effective Usage of ICT in Teaching Programs: programs of effective ICT usage with curricula focus to figure out new channels of integrating ICT usage with course curricula.

4. In-service Training of the Teachers: according to previous experiences, training teachers is an important pace of the project. Conscious, reliable and measurable usage of ICT and the Internet that focuses on teaching users of ICT, how to use relevant ICT tools with complementary information on the web as well as evaluating how people use ICT are main concerns.

5. Conscious, Reliable, Manageable and Measurable ICT Usage: Using quality ICT instruction in classrooms enables teachers to use ICT tools effectively in a classroom environment properly.

NATIONAL ICT CURRICULUM DEVELOPMENTS

There is a guideline for integrating ICT in education at large scale recognizes the value of inter-ministerial collaboration when implementing an ICT in Education plan (UNESCO, 2004). There are two main institutions in Turkey, the Ministry of National Education (MoNE) and the Higher Education Council (HEC) that are responsible for the organization and utilization of all levels of education: defining roles, concrete work plans attached to realistic budgets, and putting and following up a clear and measurable vision.

While in primary curriculum, the subject information and communication technologies(ICT) is an elective course, ICT is a mandatory course which is offered two hours per week in secondary education. These courses aim to teach basic computer skills and to introduce students to some commonly used computer applications, such as word processors, paint, and communication tools. The objectives of ICT have been defined by the MoNE. Concepts and descriptions include computer literacy terms "Literacy includes the ability to read and interpret media, to reproduce data and images through digital manipulation, and to evaluate and apply new knowledge gained from digital environments" of computers to solve problems. The main objectives are as follows (MoNE, 2005):

- to develop an understanding of the practical methods of using computers,

- to learn the definitions, developments and ways of using computers,

- to identify the basic parts and their functions of computers,

- to use basic software,

- to get information from reliable resources

The last ICT curriculum has been developed and put into practice in 2005. However, some minor modification has been made according to evaluations of research findings implemented during the process. The current ICT curriculum, which is already used to facilitate information and communication technologies in schools, is limited as to the technologies and software provided to learners (Gülbahar, Ilkhan, Kilis & Arslan 2013). Defining abilities of ICT or digital literacy is not easy, but one definition that commonly uses three „abilities" is as follows (Nutt 2010) :

- The ability to use digital technology, communication tools or networks to locate, evaluate, use and create information.

- The ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers.

- A person‟s ability to perform tasks effectively in a digital environment.

Defining or creating IT standards is an effective and important way of both teacher competencies and learners achievement levels (Thomas, & Knezek, 2008; Steiner 2012). Therefore, the existing ICT curriculum aims to include important concepts such as digital literacy, technology use, ethical considerations, security, privacy, programming concepts and cybercrime types.

Framework of National ICT

Hence, a framework of the National ICT curriculum approach was established based on the international standards of ICT (NAACE, 2007; ISTE, 2013), which was composed of four dimensions:

(1) Digital literacy,

(2) Communication, Knowledge Sharing and Self-Expression via ICT,

(3) Research, Knowledge Construction and Collaboration and

(4) Problem Solving, Programming and Development of Authentic Materials.

The general goal of the standards-based curriculum was formulated as: "learners are expected to use information and communication technologies effectively, efficiently and in parallel with the ethical values". The official name of the course is specified as "Information and Communication Technologies and Software" (Table 1).

Besides, cognitive and technical competencies are another crucial topic to take into consideration in the curriculum development process. Digital literacy can be achieved through the use of digital technologies, i.e. communication tools and social networks in the process of accessing, managing, designing, evaluating and creating information by means of cognitive and technical knowledge, skills and values through doing tasks rather than just reading about it. Furthermore, learners have different background knowledge on the topic in the huge school system, each learner should be provided with an individual instructional design according to their background knowledge.

Table 1.
ICT levels for learners used as a guide while specifying learning outcomes

Levels	Explanation
Basic I	Understanding ICT
Basic II	Accessing and Evaluating information
Intermediate I	Managing information
Intermediate II	Transforming information
Advanced I	Creating information
Advanced II	Sharing information

The mainly three levels can be summarized with two dimensions in each level, based on some taxonomies and levels defined by various researchers. In the ICT curriculum, there are ten measurable performance steps about information communication technologies skills.

Activity based and learning by doing approaches are adopted by teachers in order to emphasize their method of teaching through activity in which the students participate actively and bring about efficient learning experiences from the course. Real life related cases are the key for achieving the general objectives. These learning domains are placed in spirally at eight years curriculum.

While implementing the curriculum in their classroom, teachers are responsible for figuring out the level of each learner and then try to improve ICT knowledge for each learner individually or for the group. During the implementation of the curriculum in classroom and computer laboratory, teachers are free to decide what they teach and how. This means that they are able to design which teachers here is to choose up-to-date topics and activities in their course. In order to be a successful teacher in their teaching career, prospective teachers must be competent pedagogically and in the subject field. Pierson (2001) supported this by claiming that teachers need a subject-related content integrated with both technological and pedagogical expertise. The main aim of this curriculum is to build an international culture about ethical issues of technology using and to improve the abilities of each student.

Table 2.

ICT course levels and students grade

Basic Level	Intermediate Level	Advanced Level
1		
2		
2		
	4	
	5	
		6
		7
		8

During the teaching-learning process, assessment and evaluation should be learner centered for this curriculum. A central concern of learner-centered teaching is learning, and so evaluation in the student-centered classroom is not just to generate

grades but, more importantly, to promote learning (Weimer, 2002). As a result, alternative assessment techniques and tools that "are fulfilling the premise of learner-centeredness together with constructivist and cognitivist approaches, e-portfolio assessment" were picked for evaluating students" works and process during the course term. This approach will not only enhance contributions to a national content development process by the use of national products like EBA, Kırk Ambar etc., but will also make learners learn by doing (Gülbahar, Ilkhan, Kilis & Arslan, 2013).

MAIN BARRIERS OF ICT INTEGRATION IN TURKEY

Many big projects about technology integration into education implemented around the world as well as Turkey have some efforts for this aim. The last big ICT projects of Turkey has launched in 2011 and MoNE decided to start by equipping schools with the appropriate technology apparatus for this aim. There are many research findings related to effectiveness of this kind of projects. These findings will be used for redesign or improve the existing structures for reaching the goal of effective integration.

Pouezevara, Dincer, Kipp, and Sariisik, Y. (2013) published a report that brings up the some issues related to integration of ICT curricula. In many studies, similar results showed that there is not enough in-service training about ICT, technical support, hardware as well as there is lack of appropriate course content and instructional programs, lack of time, and lack of appropriate administrative support (Goktas, Yildirim, & Yildirim, 2010; USDE 2000). Another important issue is the fact that school leaders" preparation for supporting students day-to-day may be the key factor in the project"s successful implementation. As well as school leaders, teacher educators in the preservice should function as role models for prospective teachers in how to use ICT"s. FATIH project has a great advantage of flexibility in implementation and has provided some guidelines. However, many researchers claim that this kind of flexible model which is dependent upon individual motivation and capacity for innovation without having provided a gradual scaffolding for teachers to support them, including opportunities for peer-support, action research, sharing of best practices, and incentives for risk-taking and innovation is not enough to achieve goals.

However, it is not true to say that all teachers are left in the field without support. For this purpose, MoNE has either developed or purchased a variety of e-content software, tutorials, encyclopedias, animations, simulations, games etc. for students, for use both within and outside of the classroom. In addition, on-going face-to-face and online training are being conducted with the users of these new technological devices. Lastly, students" orientation training issue is less emphasis in the schools. However, teachers are provided with short periods of training several times, but are still needing more for both students and teachers.

Acknowledgments

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