

ICT INTEGRATION INTO CLASSROOMS

- A LITERATURE REVIEW-

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Abstract

In this paper, a literature review regarding the use of ICTs in education was provided. Benefits and roles of ICTs in education, along with planning for ICT Integration into classrooms were also mentioned. Besides, a theoretical overview of the term “digital divide” was provided.

Finally, the author focuses on Turkey’s ICT reform and depicts the related issues in order to illustrate that what kind of problems the developing countries might face when integrating ICT into their classrooms.

INTRODUCTION

This paper discusses the use of ICTs in primary education in developing countries with a focus on Turkey being itself a developing country.

The literature review is divided into the following sections:

- First, it examines the definitions of ICTs, as well as some related pertinent issues.
- The next section evaluates the different approaches to ICTs in some detail.
- This section is followed by a definition of the “Digital Divide” and an assessment of literature on the “Digital Divide”.
- Finally, a general overview of ICTs in developing countries with a focus on Turkey is provided.

MAIN DEFINITIONS

Pelgrum and Law (2003) state that near the end of the 1980s, the term ‘computers’ was replaced by ‘IT’ (information technology) signifying a shift of focus from computing technology to the capacity to store and retrieve information. This was followed by the introduction of the term ‘ICT’ (information and communication technology) around 1992, when e-mail started to become available to the general public (Pelgrum, W.J., Law, N., 2003).

According to a United Nations report (1999)¹ ICTs cover Internet service provision, telecommunications equipment and services, information technology equipment and services, media and broadcasting, libraries and documentation centres, commercial information providers, network-based information services, and other related information and communication activities.

According to another definition, ICTs are embedded in networks and services that affect the local and global accumulation and flows of public and private knowledge (Adeya, N.C., 2002).

Moreover, Adeya (2002) mentions about a more simplified definition² describing ICTs as an ‘electronic means of capturing, processing, storing and disseminating information’.

In this review, the term ICTs designates multimedia, the Internet or the Web, as a medium to enhance instruction or as a replacement for other media (Pelgrum, W.J. Law, N., 2003).

Furthermore, technologically advanced countries and developed countries are regarded as synonymous, while poorer countries are collectively referred to as ‘developing countries’ unless explicitly stated otherwise.

¹ United Nations Economic Commission (ECA 1999) in Adeya, N.C. (2002)

² Duncombe, R and Heeks, R. (1999) in Adeya, N.C. (2002)

ICTS IN EDUCATION

As Pelgrum and Law (2003) claim the issue of ‘computers in education’ started to become popular in educational policy-making in the early 1980s, when relatively cheap microcomputers became available for the consumer market. They (2003) also note that with regard to the early introduction of microcomputers in education in 1980s, there were high expectations that it would make education more effective and motivating.

Hepp, Hinostroza, Laval and Rehbein (2004) claim in their paper “Technology in Schools: Education, ICT and the Knowledge Society” that ICTs have been utilized in education ever since their inception, but they have not always been massively present. Although at that time computers have not been fully integrated in the learning of traditional subject matter, the commonly accepted rhetoric that education systems would need to prepare citizens for lifelong learning in an information society boosted interest in ICTs (Pelgrum, W.J., Law, N., 2003).

Moreover, Kozma and Anderson (2002) write in their paper “ICT and Educational Reform in Developed and Developing Countries” that education is at the core of the knowledge economy and learning society and that correspondingly, the role of ICTs in schools is shifting dramatically.

In a similar vein, Kozma and Wagner (2003) contend that the promise of information and communications technologies to enhance the basic education is a tremendously challenging area of development work today, in both poor and wealthy nations (Wagner, D., Kozma, R., 2003).

Regarding the use of ICTs in education, Ezer (2005) maintains that ‘the ICT for development literature often treats education ‘in passing’’. Additionally, Ezer (2005) notes:

Education has a central influence on the idea of ICTs and therefore it must be examined and re-examined in order to gain a better understanding of how ICTs can impact developing countries.

To quote once more from Ezer (2005):

[...] The frequency of these ‘passing mentions’ points to the fact that education is bound up in the debate on ICTs and development.

Ezer (2005) claims that much of the descriptive literature related to the implementation of ICTs to pedagogical ends and much is case study based while other research related to the problem domain involves curriculum studies³: a sub discipline within the field of education (Ezer, J.F., 2005).

It should also be noted that direct evidence from the literature reviewed shows that the survey is the most dominant technique used to gather data for ICTs and development

³ Goodson, I.F. (1994), Young, M.F.D. (1971) in Ezer, J.F. (2005)

studies including the area of education (Adeya, N.C., 2002). Besides, qualitative methodologies are used more than quantitative ones (Adeya, N.C., 2002).

Benefits and Roles of ICTs in Education

As Jhurree (2005) states, much has been said and reported about the impact of technology, especially computers, in education.

Similarly, Hepp, Hinostroza, Laval and Rehbein (2004) state that the literature contains many unsubstantiated claims about the revolutionary potential of ICTs to improve the quality of education. Hepp, Hinostroza, Laval and Rehbein (2004) also note that some claims are now deferred to a near future when hardware will be presumably more affordable and software will become, at last, an effective learning tool.

Considerable resources have been invested to justify the place of technology in education, and many research studies have revealed the benefits and gains that can be achieved by students, teachers and administrators (Jhurree, V., 2005). Although not all of the existing studies can be mentioned here, the following authors have often been mentioned in the literature:

To begin with, Hepp, Hinostroza, Laval and Rehbein (2004) state the following reasons for the application of ICTs in education:

- *A new society requires new skills:* Due to the fact that ICTs are the pre-eminent tools for information processing, new generations need to become competent in their use, should acquire the necessary skills, and therefore must have access to computers and networks during their school life.
- *Productivity enhancement:* Schools are knowledge-handling institutions; therefore, ICTs should be fundamental management tools on all levels of an educational system, from classrooms to ministries.
- *A quest for quality learning:* Schools should profoundly revise present teaching practices and resources to create more effective learning environments and improve life-long learning skills and habits in their students.

In order to address the questions of “How can ICTs be applied to support education change?” and “How can its application in education in turn support sustained economic development and social transformation?” Kozma (2005) suggests the following four types of approaches in general:

- ICTs are used to improve the delivery of and access to education. This approach can improve education on the margin by increasing the efficiency by which instruction is distributed, but it need not involve fundamental change.
- ICTs are the focus of learning. By learning ICT skills, students become better prepared for work that increasingly involves the use of ICTs.

- ICTs can be used to improve student understanding, increase the quality of education, and thereby increase the impact of education on the economy.
- Knowledge creation, technology, technological innovativeness, and knowledge sharing can contribute to the transformation of the education system and to sustained economic growth and social development.

Moreover, Papert (1997) identified the following positive effects on students of ICTs in education include:

- enhanced motivation and creativity when confronted by the new learning environments,
- a greater disposition to research and problem-solving focused on real social situations,
- more comprehensive assimilation of knowledge in the interdisciplinary ICT environment,
- systematic encouragement of collaborative work between individuals and groups,
- ability to generate knowledge,
- capacity to cope with rapidly changing, complex, and uncertain environments,
- new skills and abilities fostered through technological literacy.

Furthermore, Kozma and Anderson (2002) claim that ICTs are transforming schools and classrooms by bringing in new curricula based on real world problems, providing scaffolds and tools to enhance learning, giving students and teachers more opportunities for feedback and reflection, and building local and global communities that include students, teachers, parents, practicing scientists, and other interested parties.

Similarly, Hepp, Hinojosa, Laval and Rehbein (2004) state that the roles ICTs play in the educational system can be pedagogical, cultural, social, professional and administrative.

- *Pedagogical Tool Role:* ICTs provide a new framework that can foster a revision and an improvement of teaching and learning practices such as collaborative, project-based and self-paced learning.
- *Cultural, Social, and Professional Roles:* The cultural, social and professional roles of ICTs are exercised primarily through an effective use of the vast amount of information sources and services available today via Internet and CD-based content for the entire educational community: students, teachers, administrators and parents.
- *Administrative Roles:* ICTs have important roles to play in making school administration less burdensome and more effectively integrated to the official information flow about students, curricula, teachers, budgets and activities through the educational system information pipelines.

As Kozma and Wagner (2003) claim, ICTs can affect the pace at which the learning gap is bridged in developing countries, both domestically and in relation to other

nations. The great challenge is to harness the advantages of those technologies, in order to improve the delivery and quality of educational services, as well as to accelerate the rate at which knowledge is distributed and learning chances and outcomes are equalised throughout society (Wagner, D., Kozma, R., 2003).

Planning for ICT Integration into Classrooms

Jhurree (2005) argues that education reform is occurring throughout the world and one of its tenets is the introduction and integration of ICTs in the education system. The successful integration of ICTs into the classroom warrants careful planning and depends largely on how well policy makers understand and appreciate the dynamics of such integration (Jhurree, V., 2005).

Integration of ICTs in education has been a contentious issue (Jhurree, V., 2005). As Jhurree (2005) claims some people argue that technology will change the educational landscape forever and in ways that will engender a dramatic increase in the performance of learners (Papert, S., 1997). Unlike these extreme advocates, there are others who adopt a balanced approach (Jhurree, V., 2005). They are convinced that ICTs, if properly integrated, have the potential to enhance the teaching and learning process (Hepp, K., Hinostroza, S., Laval, M., Rehbein, F., 2004; Kozma, R., Wagner, D., 2003; Commission of the European Communities, 2001; UNESCO, 2003; Pelgrum, W.J., Law, N., 2003).

Hepp, Hinostroza, Laval and Rehbein (2004) note that in order to have long lasting effects, an ICT policy should preferably not be designed in isolation. Rather, it should be part of a more comprehensive effort towards improving the equity and quality of an educational system.

Similarly, Levine (1998) emphasises the importance of having a plan that is based on real school needs and one that is realistic, achievable, and effective. The plan should be produced, not for the sole purpose of putting technology in the classroom but to reflect the real needs of schools in order to make effective technology deployment and to produce enhanced learning environments (Levine, J., 1998).

Finally, Hepp, Hinostroza, Laval and Rehbein (2004) have been cautious to emphasize that there is no universal truth when it comes to applying ICTs in education, and that there is no advice that can be directly applied without considering each country's reality, priorities and long-term budgetary prospects and commitment.

In developing countries⁴, ICT should be combined with more traditional technologies, such as print and broadcast radio, to achieve better effectiveness (Pelgrum, W.J., Law, N., 2003).

THE “DIGITAL DIVIDE”

A major pre-occupation in the literature on ICTs and education has been the question of the “digital divide” (OECD, 2004). According to an OECD report, digital divide is

⁴ Dakar Framework for Action in Pelgrum, W.J., Law, N. (2003).

defined as the disparity in ICT diffusion and use between industrial and developing countries (or, indeed, between rich and poor, men and women, urban and rural areas within individual countries) (OECD, 2004).

As Wachira (2005) states that in developing countries where less than 1% of the population has access to ICTs, the digital divide is largely a rural-urban divide with those in the urban areas being on the vantage point (Wachira, E., 2005).

Compaine (2001) claims in his book “The Digital Divide : Facing A Crisis or Creating A Myth ?” that today’s digital divide was yesterday’s computers-in-the-schools divide, the television divide of 1955, the radio divide of 1930, or the book divide of the previous half-millennium. The difference between then and now is that both technologies seem to eliminate most of these gaps at much faster rates (Compaine, B.M., p.102)

In his paper “Assessment of Existing Empirical Analyses of the Underlying Causes of the Digital Divide and Policy”, Wijewardena (2002) suggests that there are six key underlying causes of the digital divide. These are, the disparities in access to non ICT resources, the impact of the digital divide being a driver of the digital divide, cultural features, language issues, level of urbanisation and the level of concentration of ownership in ICTs infrastructure and services (Wijewardena, M., 2002).

As Adeya (2002) quotes in his paper “ICTs and Poverty” from Barlow (1998):

Common perceptions of the potential of the digital age are limited by the habits of mind one develops in an industrial society. These habits are different for those who have grown up in poverty with no television sets for instance to shape their world view.

However, Adeya (2002) also notes that the basis of this argument is weak however since Barlow has no empirical evidence to support his assertion, apart from his experiences in the countryside of a developed country (Adeya, N.C., 2002).

Moreover, Pelgrum and Law (2003) argue that while technology has the potential of bringing educational opportunities to more remote areas, the introduction of IT into schools becomes confined for developing countries due to the demands on infrastructure investment. Thus, the divide between urban and rural areas might be widened and consequently it might introduce a digital divide to the existing economic and educational divides (Pelgrum, W.J., Law, N., 2003).

Finally, Bracey (2005) puts forward that it is critical to ensure that the digital divide between developing and developed countries is bridged through the introduction of ICTs into elementary school systems where early learning begins. In his point of view, the challenge for all is to make use of new technologies in meaningful ways to maximize their value to learners, teachers and others involved in the dissemination of the uses of technology (Bracey, B. *et al.*, 2005).

(For a further discussion about the literature regarding the digital divide please refer to the second assignment of the writer.)

A THEORETICAL OVERVIEW OF “DIGITAL DIVIDE”

According to Hinostraza, Guzman and Isaacs (2002), the introduction and use of IT in education is commonly associated with a process of ‘educational innovation’⁵, either acting as a Trojan Horse⁶, as a catalyst⁷ or, more recently, as a lever⁸, in other words, a tool that must be applied purposefully to a task to be of value. These different categories might show the evolution of the role that ICTs play in educational innovation and also show its prevalence associated to processes of educational innovation (Hinostraza, J.E., Guzmán, A., Isaacs, S., 2002). This has set an international scenario in which there is widespread presence of ICTs in schools (Hinostraza, J.E., Guzmán, A., Isaacs, S., 2002).

In this context, Hepp, Hinostraza, Laval and Rehbein (2004) claim that ICTs can be powerful lever for change when new directions are carefully planned, staff and support systems are prepared, and resources for implementation and maintenance are provided. In this context Hepp, Hinostraza, Laval and Rehbein (2004) state that ‘no miracles derive from the mere presence of ICTs in a school; they do not act as catalysts for widespread improvements’.

Similarly, Norris (2001) states in her book “Digital Divide” that ‘there is a theoretical debate between cybertoptimists who see ICTs as great leveler and cyber-pessimists who envisage greater inequality emerging’ (Norris, P. 2001: 9).

There are many approaches in the literature related to the digital divide. The instrumentalist approach deserves special attention due to its frequent mention in the literature. With regard to this approach, Trujillo’s (2000) statement is worth quoting at length:

The “instrumentalist” approach considers digital information and communication technologies as a powerful instrument with the ability to act as a catalyst to “desirable” change in the structure of society.

Furthermore, Trujillo (2000) notes that ‘a positivist instrumentalist approach to bridge the digital divide considers that the characteristics of IT (convergence and cost-reduction) hold the potential for “leapfrogging” development stages⁹.’

In contrast to the positivist instrumentalist approach, the fatalist structuralist approach considers that the existing structure of social stratification will remain unaltered since the prevailing power structures will benefit from IT and other technologies (Trujillo, M., 2000). Trujillo (2000) also claims:

⁵ Wright, A. (1987); Grunberg, J. & Summers, M. (1992); Fullan, M.G. (1996) in Hinostraza, J.E., Guzmán, A., Isaacs, S. (2002)

⁶ Olson, J. (1988) Hinostraza, J.E., Guzmán, A., Isaacs, S. (2002)

⁷ Hawkridge, D. et al. (1990); McDonald, H. & Ingvarson, L. (1997) in Hinostraza, J.E., Guzmán, A., Isaacs, S. (2002)

⁸ Venezky, R. L. (2002) in Hinostraza, J.E., Guzmán, A., Isaacs, S. (2002)

⁹ Bell, M. (1985); Cane, A. (1992); Canning, D. (1999); OECD (1989) in Trujillo, M. (2000)

Developed and developing countries will witness how digital information technologies are used by elite countries, and the elite within countries.¹⁰

Another approach in the literature has been defined by Norris (2001). According to Norris (2001), optimists hope that development of ICTs has the capacity to reduce, although not wholly eradicate, traditional inequalities between rich and poor. Additionally, Norris (2001) also claims that, pessimists believe that digital technologies will reinforce existing disparities while skeptics suggest that both fears and hopes are exaggerated.

ICTS IN DEVELOPING COUNTRIES

So far, this literature review has discussed the importance of ICTs in the educational arena and provided the reader with an insight about its potential benefits in the related area. A theoretical framework regarding the digital divide has also been stated due to the fact that –as mentioned previously- it has been a major pre-occupation in the literature on ICTs and education (OECD, 2004). At this point, it might be useful to inform the reader about the use of ICTs in developing countries since the rest of the study will give more insight from the case of Turkey being itself a developing country.

The idea that IT can help developing countries is intriguing to many, because of the benefits that have apparently been realized in the West (Avgerou, 1990). As Avgerou (1990) notes ‘the literature sometimes contains a naïve taken-for-granted assumption that the success of the West is attributable to ICTs, and therefore bringing the benefits of this development to poorer countries is simply a matter of delivering IT.’

Motivated by the prospect of greater economic, social, educational and technological gains, both developing and developed countries, are bringing about education reform, with a clear focus on ICT integration in education (Jhurree, V., 2005).

Although ICT is now at the centre of education reform efforts, not all countries are currently able to benefit from the developments and advances that technology can offer (Kozma, R., Anderson R.E., 2002). Significant barriers that are often referred to as “the Digital Divide” limit the ability of some countries to take advantage of technological developments (Kozma, R., Anderson, R.E., 2002). Thus, developing countries are faced with challenges related to access, pedagogy or assessment when using ICT to improve and reform education (Kozma, R., Anderson, R.E., 2002).

Due to the fact that much research in the area of technology integration in education has been conducted in technologically advanced countries, but little in the developing countries, few statistics are available from developing countries (Jhurree, V., 2005). According to Jhurree (2005), this might imply that the former countries now possess a wealth of knowledge, skills, expertise, and the competitive edge that most of the latter countries do not possess. On the other hand, as Jhurree (2005) suggests, the latter countries can gain a lot from the expertise of their advanced counterparts.

¹⁰ Barber, B.R. (1996); Stoll, C. (1995) in Trujillo, M. (2000)

Consequently, developing countries might not require investing as much as their more developed counterparts have had to do (Jhurree, V., 2005).

According to a study undertaken by Kozma and Anderson (2002), both developed and developing countries are beginning to use their investment in ICTs to reform education.

Moreover, Hepp, Hinostroza, Laval and Rehbein (2004) claim that developing countries have become anxious about the widening gap between their reality and the aggressive ICT policies of some developed countries. Consequently, there is a more urgent need to improve the quality and equity of education to bridge the gap between developed and developing nations, and ICTs are perceived as necessary tools for this purpose (Hepp, K., Hinostroza, S., Laval, M., Rehbein, F., 2004).

THE CASE OF TURKEY

Since the establishment of the Republic of Turkey in 1923, the Turkish society has been going through an enormous transformation, involving social, cultural, intellectual, economic and structural dimensions (Dogac, A., Acar, A., Putnam, M. , 2005). The government of the Republic of Turkey has been moving to integrate the country into Europe since its founding by Mustafa Ataturk in 1923 and in line with this long-term national aim, Turkey has been investing aggressively in ICT projects in recent years, building bridges between Europe and the East (Dogac, A., Acar, A., Putnam, M. , 2005).

In Turkey, the objectives of ICTs at primary level are defined by the Ministry of National Education (MoNE) under specific definitions (Goktas, Y., Yildirim, Z., 2003). Definitions focus mainly on making students computer literate (Goktas, Y., Yildirim, Z., 2003). Additionally, another inference from the definitions includes creating an individual who able to use computers to solve the emerged problems (Goktas, Y., Yildirim, Z., 2003). Objectives are distinguished as follows (Kocaoluk, F. & Kocaoluk, M.S., 2000):

- to get information about practical methods of using computers,
- to get information about the definition, developments and ways of using computers,
- to comprehend the numerical systems used in computers,
- to identify the basic parts and their functions of computers,
- to gain basic knowledge and skills on the use of computers and computer programming,
- to get the exact knowledge from the computers ,
- to load the intended knowledge to the computers,
- to get the information about the computers used at most,
- to practice basic programs on computers.

The results of the study undertaken by Goktas and Yildirim (2003) showed that importance given to integration of ICTs into education is increased in Turkey. As Goktas and Yildirim (2003) state, Turkey faces great educational challenges with great number of people to educate, a very large educational system, poor economic situation, inadequate technologies and mass number of students and teachers. In spite

of these negative conditions, Turkey has to take required measures in order to catch up with the EU standards in integrating ICTs into its educational system (Goktas, Y., Yildirim, Z., 2003).

Turkey's ICT Reform in Education

One should bear in mind that, not long ago- until 2005-, the pedagogy, curriculum, and textbooks within Turkey's educational system were emphasizing the memorization of subject matter facts and principles. Similarly, student examinations were also based on memorization. Besides, it is worth to mention that there are high-stakes tests that determine the educational (and consequently, the economic) future of the young people in Turkey. So, the use of ICTs in schools was reinforcing the curricular and pedagogical emphasis on rote learning (Kozma, R., 2005).

Recently, the government introduced educational reforms to prepare students for a modern future in which Turkey is open to cultures of other peoples and school learning becomes integrated into that of the outside world (Kozma, R., 2005).

With the adoption of a policy document for integrating ICTs as an indispensable part of lifelong learning in 2004, MoNE put an effort to receive an enrolment ratio at basic education (Grade 1 through Grade 8) around 97%, however there are still ongoing efforts in order to bring this ratio up to 100% (European Commission, 2005). Several other measures to increase enrolment in basic education, including building more boarding schools, can be cited such as 'The Support Campaign for National Education', 'The Campaign for Girls' Education' ('Haydi Kizlar Okula'), and '100% Support for Education Campaign'.

ICT initiatives that have been completed or in progress indicate that the government is committed to the use of ICTs for management, education and training purposes (European Commission, 2005). The significant improvement of the ICTs infrastructure during the last several years is clearly evident in the following figures taken from the country report for the European Commission (2005):

- 8.950 ICT classrooms have been established in year 2004.
- 6.400 ICT classroom have been planned for year 2005.
- Distribution of 45.064 PC's for use of teachers has taken place in year 2005 and the hardware components are supported by related instructional and administrative software and web based applications.
- Broadband Internet access options like satellite, ISDN or ADSL have been provided for all of 42.534 schools.
- Connection for about 20.000 schools has been provided.

As part of computer-assisted education, efforts have been made to spread the use of computers. In the academic year 2000-2001, the number of schools with computers has reached 5.536 (MEB, 2005). Moreover, the average of the pupils for per computer at primary education in Turkey is 103,5 (Please refer to Table 1.0) and learning about

ICTs is not included in the compulsory curriculum in primary, but offered as an elective course (Goktas, Y., Yildirim, Z., 2003). One or two hours to be devoted to it is seldom specified in the curriculum for primary education (Goktas, Y., Yildirim, Z., 2003). It sometimes depends on the school or students. It varies: one or two hours a week in Turkey (Kocaoluk, M. & Kocaoluk, F.S., 2000).

Countries	Land Area ¹ (1000 km ²)	Population ¹ (2001)	GNP ¹ (€) (2000)	The number of Comp. per 1000 People ¹ (1999)	The Number of Students in Primary & Secondary Education ² (2000)	The Number of Teachers in Primary & Secondary Education ² (2000)	Pupils per Computer at Primary Educ. ³	Pupils per Computer at Sec. Educ. ³
Total or Average of the EU	3.193.000	379.448.000	<u>24.463</u>	<u>278</u>	60.802.600	4.501.500	<u>13,2</u>	<u>8,6</u>
Austria	84.000	8.140.000	25.260	260	1.136.500	101.500	8,9	8,5
Belgium	31.000	10.292.000	24.220	313	1.831.300	192.700	11	8
Denmark	43.000	5.367.000	32.580	414	810.300	82.500	4,2	1,5
Finland	338.000	5.195.000	25.350	360	878.500	62.000	7,5	6,8
France	544.000	59.343.000	23.250	220	9.813.300	709.100	14,1	9,4
Germany	357.000	82.360.000	24.640	297	11.963.100	817.600	19,2	13,7
Greece	132.000	10.596.000	11.650	61	1.384.100	123.800	29,4	15,2
Ireland	69.000	3.873.000	27.320	321	787.900	47.700	11,6	8,3
Italy	301.000	58.018.000	20.190	191	7.240.700	680.100	20,8	8,9
Luxembourg	3.000	447.000	46.590	396	57.400	5.000	2	6,3
Netherlands	41.000	16.101.000	25.190	362	2.657.800	227.600	8,3	9,1
Portugal	92.000	10.303.000	11.510	93	1.642.200	152.700	17	16,4
Spain	505.000	40.428.000	15.220	122	5.939.600	459.800	11,2	12,4
Sweden	411.000	8.910.000	28.010	452	1.729.500	129.400	9,7	4,1
The UK	242.000	60.075.000	25.970	304	12.930.400	710.000	11,8	6,4
Turkey	770.000	65.300.000	3.200	32	12.339.254	511.062	103,5	35,2

Table 1. Comparison of the Basic Indicators between the European Union Countries and Turkey

Current Issues in Turkish Educational System

Although ICTs hold great potential to support ongoing educational as well as national development efforts, several challenges have affected its large-scale deployment and utilization for educational purposes, and these have very much reduced its capacity to do the nation good (Fouth, J.C., 2005).

To begin with, as a related study undertaken by Akbaba- Altun (2006) states there are general computer integration issues such as too few computers, slow Internet connections, insufficient software in the native language, and a lack of peripheral equipment at schools. Moreover, the IT classrooms at schools were placed in existing older classrooms that were not designed according to the needs of IT classrooms at schools, so there is a need for future schools designed with adequate wiring, ergonomics and security in IT classrooms (Akbaba- Altun, S. 2006).

According to the study of Akbaba- Altun (2006), another common issue is the insufficient in-service training courses for teachers, especially in content areas. Training courses are provided by unqualified trainers and are not appropriate for teachers' needs and levels; besides these in-service training courses also have a lack of hands-on activities and are not offered for school principals and teachers (Akbaba-Altun, S., 2006).

Akbaba- Altun (2006) also claim that curriculum problems generally stem from the available software programs at schools. According to the findings of their study, these software programs were not considered to be suitable for the students' grade levels by the participants. Moreover, the suggested curriculum for 4th to 8th graders is almost the same and upper grades do not build upon their knowledge (Akbaba- Altun, S. 2006). Another issue is the relatively high software prices which makes it difficult for schools to purchase (Akbaba- Altun, S. 2006).

Moreover, it is claimed that school principals' lack of technical knowledge, their interpretations of regulations according to his/her own will, and their lack of support pave a way for the given problems and issues (Akbaba- Altun, S. 2006). In addition, although providing security is one of the roles of the principals related to IT classrooms they mostly do not take necessary precautions at their schools for IT classrooms in particular, and thus computers are not protected against burglary (Akbaba, S., Altun, 2006).

Another important issue is that the supervisors do not consider themselves as competent enough to be able to supervise IT classrooms (Akbaba- Altun, S. 2006). There needs to be a priori training and support before supervisors are sent to schools (Akbaba, S., Altun, 2006).

Deriving from the findings of this study, some of the factors which have affected the effective deployment and utilization of ICTs for educational purposes in Turkey can be summarized as:

- Inadequate ICT infrastructure including computer hardware and software, and bandwidth/access;

- A lack of skilled manpower, to manage available systems and inadequate training facilities for ICT education;
- Resistance to change from traditional pedagogical methods to more innovative, technology-based teaching and learning methods, by both students and academics (Fouth, J.C., 2005);
- The over-dependence of educational institutions on government for everything has limited institutions' ability to partner with the private sector or seek alternative funding sources for ICT educational initiatives.
- Lack of effective co-ordination of all the various ICTs for education initiatives (Fouth, J.C., 2005).

The list is not exhaustive but represents the major problems faced in the development of ICTs for education in Turkey as well as in other developing countries. It is believed that if these are adequately addressed, e-education will thrive in Turkey (Fouth, J.C., 2005).

REFERENCES

- Adeya, N. C. (2002) *"ICTs and Poverty: A Literature Review"* [Internet] UNESCO. Available from: < http://www.idrc.ca/en/ev-24718-201-1-DO_TOPIC.html > [Accessed 7 January 2006]
- Akbaba- Altun, S. (2006) *"Complexity of Integrating Computer Technologies into Education in Turkey"*. Educational Technology and Society [Electronic] 5(3), pp.367-380. Available from: < www.ifets.info/journals/9_1/15.pdf > [Accessed 29 January 2006]
- Avgerou, C. (1990) *"Computer-Based Information Systems and the Modernisation of Public Administration in Developing Countries"*. In S. Bhatnagar, Bjorn-Andersen, N. "Information Systems for Development" (London, Falmer) pp. 70-85.
- Bracey, B. (2005) "ICT: A Powerful New Tool to Teach Literacy". In Bracey, B., Culver, T., Ed. *"Harnessing The Potential of ICT for Education- A Multistakeholder Approach"* [Internet] United Nations ICT Task Force. Available from: < <http://www.digitaldivide.net/comm/docs/view.php?DocID=199> > [Accessed 17 January 2006]
- Commission of European Communities. (2001) *"Information and Communication Technologies in Development: The Role of ICTs in EC Development Policy"*. Brussels, Commission of the European Communities. Available from: <<http://europa.eu.int/rapid/pressReleasesAction.do?reference=IP/02/116&format=HTML&aged=0&language=EN&guiLanguage=en>> [Accessed 13 December 2005]
- Compaine, B. M. (2001) *"The Digital Divide: Facing A Crisis or Creating a Myth?"* (Boston, MIT University Press)
- Dogac, A., Acar, A., Putnam, M. (2005) ".tr" [Internet] Ministry of National Education in Turkey. Available from: < <http://www.meb.gov.tr/refer2/dogacacar.htm> > [Accessed 23 January 2006]
- European Commission (2005) *"Implementing the Education and Training 2010 Work Programme"*. [Internet] European Commission. Available from: < europa.eu.int/comm/education/news/what/index_en.html > [Accessed 13 December 2005]
- Ezer, J. F. (2005) *"Interplay of Institutional Forces behind Higher ICT Education in India"*. Department of Information Systems. London, London School of Economics and Political Science.
- Fouth, J. C. (2005) "ICT in Education: A Practical Approach". In Bracey, B., Culver, T. (eds.) *"Harnessing the Potential of ICT for Education- A Multistakeholder Approach"* [Internet] United Nations ICT Task Force. Available from: <<http://www.digitaldivide.net/comm/docs/view.php?DocID=199> > [Accessed 10 December 2005]

Goktas, Y., Yildirim, Z. (2003) *"A Comparative Analysis of The EU Countries' and Turkey's Regarding The Integration of ICT in Primary Education Curricula and Teacher Education Programs"* European Conference on Educational Research University of Hamburg. [Internet] European Commission. Available from: < <http://www.europa.eu.int/nati/tr/ict.htm> > [Accessed 19 December 2005]

Hepp, K. P., Hinostroza, S.E., Laval, M.E., Rehbein, L. F. (2004) *"Technology in Schools: Education, ICT and the Knowledge Society"* [Internet] OECD. Available from: < www1.worldbank.org/education/pdf/ICT_report_oct04a.pdf > [Accessed 15 December 2005]

Hinostroza, J. E., Guzmán, A., Isaacs, S. (2002) *"Innovative Uses of ICT in Chilean Schools"*. Journal of Computer Assisted Learning 18: 459-469.

Jhurreev, V. (2005) *"Technology Integration in Education in Developing Countries: Guidelines to Policy Makers"*. International Education Journal [Electronic], 6(4): 467-483. Available from: <<http://ehlt.flinders.edu.au/education/iej/articles/v6n4/jhurree/paper.pdf> > [Accessed 18 December 2005]

Kocaoluk, F., Kocaoluk, M. Ş. (2000) *"İlköğretim Okulu Programı 1-8"* (Kocaoluk Yayınevi, İstanbul)

Kozma, R. (2002) *"ICT and Educational Reform in Developed and Developing Countries"*. [Internet] OECD. Available from: < http://download.intel.com/education/wsis/ICT_Education_Reform_Economic_Growth.pdf > [Accessed 12 December 2005]

Kozma, R. (2005) *"National Policies that Connect ICT-Based Education reform to Economic and Social Development"* Human Technology [Electronic], 5(4): 358-367. Available from: < www.humantechnology.jyu.fi/current/abstracts/kozma05.html > [Accessed 25 December 2005]

Kozma, R., Anderson, R.E. (2002) *"Qualitative Case Studies of Innovative Pedagogical Practices Using ICT"*. Journal of Computer Assisted Learning 18: 387-394.

Levine, J. (1998). *"Planning Strategically for Technology Integration"* [Conference proceedings]. Association for the Advancement of Computing in Education. Available from <http://www.coe.uh.edu/insite/elec_pub/HTML1998/el_levi.htm> [Accessed 17 January 2006]

Norris, P. (2001) *"Digital Divide"*. (Cambridge, Cambridge University Press)

OECD (2004) *"ICTs and Economic Growth in Developing Countries"*. [Internet] OECD. Available from: < <http://www.oecd.org/dataoecd/15/54/34663175.pdf> > [Accessed 15 December 2005]

Papert, S. (1997) *"The Connected Family, Bridging the Digital Generation Gap"* (UK, Long Street Press)

Pelgrum, W. J., Law, N. (2003) *"ICT in Education around the World: Trends, Problems and Prospects"* UNESCO- International Institute for Educational Planning. [Internet] Available from:
<<http://www.worldcatlibraries.org/wcpa/ow/02d077080fcf3210a19afeb4da09e526.html>> [Accessed 17 January 2006]

Trujillo, M. (2000) *"The Global Digital Divide: A Practical and Theoretical Overview"* Department of Information Systems. London School of Economics and Political Science. Available from:
<<http://studentweb.tulane.edu/~mtruill/diss/Chapter3-Overview.pdf>> [Accessed 19 December 2005]

UNESCO (2003) *"Developing and Using Indicators of ICT Use in Education"* UNESCO- International Institute for Educational Planning. [Internet] Available from:
<http://portal.unesco.org/ci/en/ev.php-URL_ID=12438&URL_DO=DO_TOPIC&URL_SECTION=201.html> [Accessed 5 January 2006]

Wachira, E. (2005) "ICT in Education: A Practical Approach". In Bracey, B., Culver, T. (eds.) *"Harnessing the Potential of ICT for Education- A Multistakeholder Approach"* [Internet] United Nations ICT Task Force. Available from:
<<http://www.digitaldivide.net/comm/docs/view.php?DocID=199>> [Accessed 10 December 2005]

Wagner, D., Kozma, R. (2003) *"New Technologies for Literacy and Adult Education: A Global Perspective"* The Education for All Initiative, World Summit on the Information Society, and Leave No Child Behind. UNESCO- International Institute for Educational Planning. [Internet] Available from:
<http://www.literacyonline.org/products/wagner_kozma.pdf> [Accessed 1 February 2006]

Wijewardena, M. (2002) *"Assessment of Existing Empirical Analyses of the Underlying Causes of the Digital Divide and Policy. Prescriptions to Deal with Such Underlying Causes of the Digital Divide- Ideas for Policy Makers"* Communications Research Forum. British Journal of Educational Technology 8 (5): 311-321