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USE OF INFORMATION COMMUNICATION TECHNOLOGY BY CHILDREN IN TURKEY

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Abstract

Information communication technologies (ICT) have launched a new era of "non-industrial" communities. Today, ICT is recognized to greatly influence the primary, secondary, and tertiary sectors of the economy, that is, agriculture, industry, and services, respectively. Education affects every dimension of social life with the increasing number of new applications such as intelligent robots, big data, cloud services, Internet of things, artificial neural networks, and 3D printing[2]. In this context, every part of society must use these technologies effectively. Unfortunately, there are inequalities in the use and ownership of ICT. The concept of digital divide refers to the gap between ICT owners and non-ICT owners. ICT can reshape the global economy. An important problem in this regard is to develop skilled man power that will be able to use and adopt these technologies and develop new ones. This study analyses ICT use by children, who will be knowledge workers of the future, by using current reports and data.

Keywords: Information Communication Technologies (ICT), Digital Divide, Information Society, Children in Turkey

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[2] The form of production that is shaped by these technologies is now called Industry 4.0 (Schwab, 2016: 24).

1. INTRODUCTION

Information communication technologies[3] (ICT) have now become increasingly important owing to rapid developments in computers and computer network structures. ICT has greatly influenced people's daily life and work and their relationship with the state. ICT has become a new key factor promoting rapid growth and prosperity in the global economy. In this transformation, the production, storage, and transmission of knowledge are of great importance. The extension of ICT can change the public and society. The integration of computer networks in contemporary institutions and enterprises have enabled activities to be run quite rapidly and in a coordinated manner. Therefore, ICT is expected to have several beneficial effects on the economy in the long term (Norris, 2006).

However, the current global information age is also characterized by increasing disparities in Internet and ICT access. Developed western countries have been able to successfully incorporate ICT in their educational, social, and economic activities and in their democratic process, with Internet penetration reaching 25% in such countries and as high as 50% in the US and Scandinavian countries. In developing countries, Internet penetration is lower, with scientists, academicians, and students enjoying greater access compared with ordinary citizens. In these countries, the Internet could enable vital access to global information resources including full-text databases and e-periodicals (Canbey–Özgüler, 2007).

Historically, ICT covers many infrastructural systems that are developed and operated independently of each other. The 'Internet of Things (IoT)' standard published by the International Telecommunication Union (ITU) in 2005 indicates that many new elements can be connected to telecommunication networks. The 'Big data' produced by numerous connected IOT devices can result in new applications in many areas such as agriculture, healthcare, climate change, and disaster management. IoT, defined as a 'global infrastructure for the information society' by the ITU, enables various ICT (physical and virtual) devices to be connected.

The Internet has expanded quite rapidly. Radio took 38 years to gain 50 million users and become a mass medium; television and the telephone system respectively took 13 and 74 years. By contrast, the Internet took only 4 years. No other industry has grown as quickly and created as much wealth in such a short time (Canbey-Özgüler and Aşan, 2007). ICT and the Internet, a concrete manifestation of ICT, have reshaped the public and trade. With the redefining of the social and economic statuses of countries, the term, 'fourth-world countries' has emerged to describe countries that are

[3] ICT sector consist of; hardware, software, services and equipment. According to OECD Classification main ICT products; office, accounting and comminutions machinery, insulated wire and cable, electronic valves and tubes and other electronic components, instruments and appliances, instruments and appliances for measuring, checking, testing, navigating etc. industrial process equipment. Relating to ICT services, equipment, wholesale, retail, telecommunication and computer services.

underdeveloped in terms of both capabilities and resources. Despite the rapid expansion of the Internet, it cannot be considered universal. With regard to ICT and Internet access, polarizing issues such as Internet access ownership and number of Internet users are not debatable.

The imbalanced and unequal distribution of ICT among countries has resulted in a 'digital divide'. Without the cooperation of international organizations, governments, the private sector, and nongovernmental organizations, ICT and its accompanying rapid technological developments will create a huge divide between poor and wealthy countries that will only increase with time.

The digital divide concept should be examined in terms of technology and man power as well as in terms of individual-, region-, and gender-based differences. First, the 'global digital divide' in ICT and Internet access between developing and developed countries constitutes an important dimension of this concept. Second, the digital divide concept defined according to the income level of countries emphasizes the social aspects of this issue. Third, the democratic dimension of the digital divide considers the role of digital technologies in securing democratic rights. The definitions of digital divide in terms of ICT expansion are also debatable. The digital divide concept also considers ICT use differences in terms of the financial state, capability needs, and requirement of these technologies as well as how they are shaped by social, economic, political and geographical differences among countries.

This study analyses ICT use by children who will be knowledge workers of the future and analyses current reports and data. It also makes a comparison within the frame of the digital divide concept among countries benefiting from the use of ICT data by children by considering the case of Turkey. Related data is taken from 'Survey on ICT Usage in Households and by Individuals has been Widened to include children between 06-15 in 2013'. Within this scope, the following indicators have been calculated for children: 'Computer and Internet usage', 'Mobile phone usage', and 'TV viewing habits'. Turkey's ICT data are discussed in comparison with global data.

2. GLOBAL DIGITAL TECHNOLOGY USAGE

The number of Internet users is increasing worldwide. By the end of 2018, 4 billion people are expected to be online worldwide, and this number will continue increasing rapidly. Today, ~40% of the world's population is online (www.internetstats.com). In developed countries, 70% of the population is online, and in Iceland, the Netherlands, and Norway, more than 90% of the population is online. However, this rate is only ~20% in developing countries. Although Internet connections worldwide have increased sevenfold in the last five years, differences between regions continue. A European user has 25 times more international Internet use capacity than an African one (ITU, 2011; ITU, 2015). Nonetheless, Internet use in Africa is increasing rapidly. In 2018, the number of Internet users increased by 20% compared to the previous year (www.worldometers.com).

Table 1. Worldwide Population and Number of Internet Users (1993–2013)

	Worldwide Population	**Population of Age 0–14 Years**[4]	**Number of Internet Users**	**Internet Penetration Rate (%)**[5]
1993	5,578,865,110	1,794,000,000	14,161,570	0.3
2003	6,357,991,750	1,835,000,000	778,555,680	12.2
2013	7,162,119,430	1,898,000,000	2,712,239,573	37.9
2018	7,593,000,000	1,939,000,000*	4,021,000,000	53

*** 2016 Source:** http://www.itu.int/ ; http://wearesocial.com, https://data.worldbank.org/

Table 1 shows how the number of Internet users as a proportion of global population has increased rapidly from 0.3% in 1993 to 37.9% in 2013 and further to 53% in 2018.

According to Table 2, in 2017, mobile phone use in developed, developing, and least-developed countries (LDCs) was 113.3%, 8.0%, and 0.9%, respectively. Furthermore, in 2017, the proportion of the population using the Internet in developed, developing, and least-developed countries was 81.0%, 41.3%, and 17.5%, respectively[6] ICT applications have not expanded universally, and they have mostly been used by wealthy and educated people. Although the Internet could potentially benefit poor countries, many researchers have doubted this idea. For example, it is impossible to effectively use the Internet in countries where the education level is not sufficiently high, and therefore, Internet access will not afford much benefit. Studies have shown that people do not need special skills to use a telephone, but they do need skills additional to speaking skills to use e-mail and other Internet services.

Among ICT indicators, fixed and mobile phone users and Internet users are frequently addressed at region or country level. Table 2 shows that worldwide fixed telephone usage increased from 19.1 per 100 people in 2005 to 37.3 per 100 people in 2017. Similarly, mobile phone usage rose increased from 33.9 per 100 people in 2005 to 103.5 per 100 people in 2017. Mobile phone usage rates generally increased in all regions, and they increased by more than two times in LDCs.

The number of Internet users worldwide increased from 15.8 per 100 people in 2005 to 48 per 100 people in 2017. When fixed telephone subscribers are considered

[4] World Bank staff estimates using the World Bank's total population and age/sex distributions of the United Nations Population Divisions World Population Prospects: 2017 Revision.

[5] Internet Penetration Rate is the percentage of internet users in the total population. By 2018, Internet penetration rates were 34% in Africa, 73% in the Americas, 48% in the Asia-Pacific region, 80% in Europe and 65% in the Middle East.

[6] 24.4% of children aged 06-15 have their private computers, while 13.3% have mobile phones and 2.9% have game consoles in Turkey (http://www.turkstat.gov.tr/PreHaberBultenleri.do?id=15866).

along with mobile phone subscribers and Internet users, mobile phone subscribers are seen to have shown the largest increase. As seen in Table 2, a similar tendency was seen in all regions. This table also clearly shows the large gap between the number of users in developed and developing countries.

Table 2. Proportion of Fixed and Mobile Telephone Users and Internet Users Worldwide (per 100 people)

	Fixed Telephone Users			**Mobile Telephone Users**			**Internet Users**		
	2005	**2010**	**2017**	**2005**	**2010**	**2017**	**2005**	**2010**	**2017**
Worldwide	19.1	44.6	37.3	33.9	76.6	103.5	15.8	28.9	48.0
Developed Countries	47.2	44.6	37.3	82.1	113.3	127.3	51.3	66.5	81.0
Developing Countries	12.7	11.9	8.0	22.9	68.5	98.7	7.7	20.6	41.3
Least-Developed Countries	0.9	1.0	0.9	5.0	33.1	70.4	0.8	4.3	17.5

Source http://www.itu.int/en/ITU-D/Statistics/Pages/definitions/regions.aspx

3. ICT USE BY CHILDREN IN TURKEY

Children and teenagers comprise roughly 60% of the global population. Children and teenagers are greatly affected by social, economic, technological, and political changes. In particular, it is important to educate children in the skills required for using new technologies. Toward this end, the first step is to provide children with access to education instead of engaging in child labour. Obviously, this issue is closely related to a country's socioeconomic status; nonetheless, children's education should be prioritized at a national level. As shown in Table 2, developed countries enjoy good ICT access. Developing countries need to eliminate child labour and provide childhood education to derive benefits from ICT; otherwise, bridging the digital divide may get harder.

In fact, when used judiciously, ICT can support different aspects of the learning and development processes of young children, including language, creativity and problem-solving skills. Children can also play and learn together using ICT, which can foster their ability to communicate and collaborate. Moreover, ICT facilitates more personalized learning, and thus, it can diversify and increase learning opportunities for every child, including those with special educational needs. The benefits of ICT in children's learning and development are particularly high when applications are educational, play-based, free of harmful contents and stereotypes; encourage collaboration; and allow children to be in control of their learning processes (Umayahara, 2014).

In USA, the percentage of children with home access to computers increased steadily from 15% in 1984 to 76% in 2003 and 85% in 2012. In addition, the percentage of children with home access to the Internet increased from 11% in 1997, the first year for which such estimates are available, to 42% in 2003 and 62% in 2012. However, both computer ownership and Internet usage at home decreased in 2013 to 79% and 57%, respectively (https://www.childtrends.org/indicators/home-computer-access).

According to Conrad (2018), in a typical day, children consume just over 3 h of media. This includes computer use, cell phone use, tablet use, music, and reading. Two-thirds of this time is spent with "screen media" (TV, computers, the Internet, etc.), and reading accounts for less than 20 min per day. The time spent with on-screen media has increased dramatically from toddler to preschool to school-age years. Children under two have an average screen time of 53 min per day. This increases to almost 2.5 h per day for children of age 2–4 years and almost 3 h for children of age 5–8 years. Although the use of computers, the Internet, and electronic devices is increasing steadily among children, children continue to spend most of their time with the television. In fact, 65% of children under 8 years of age watch television daily. On average, they spend 100 min watching TV every day. As a group, these children spend an average of 25 min per day playing video games. Furthermore, 66% of all children under 2 years of age have watched television. Television watching typically begins at 9 months of age. Compared to watching television, playing video games starts later, but nearly half of all children aged 2–4 years have played video games. This proportion increases dramatically with children aged a few years more—81% have played video game console games and 90% have used computers. Furthermore, 10% of children under 8 years of age have used educational software; 6% have used a computer for homework; and 11% use a cell phone, iPod, or iPad/tablet. Listening to music actually decreases from birth to 8 years of age. Children up to 1 year of age spend an average of 39 min per day listening to music; however, this decreases to 30 min for ages of 2–4 and just 23 min for ages of 5–8. By age of 8 years, 96% of children have watched TV, 90% have used a computer, 81% have played console video games, and 60% have played games or used apps on a portable device (cell phone, handheld gaming system, iPod, or tablet) (http://www.techaddiction.ca/media-statistics.html).

The Survey on ICT Usage in Households which was carried out in May 2013 has been widened to include children aged 6–15 years[7]. In this survey; computer, Internet, and cell phone usage with frequency and purpose aspects along with relations with media have been examined at aggregated levels for the age group of 6–15 and broken down for age groups of 6–10and 11–15 to better observe the differences.

[7] According to wordbank statsitics 0-14 age group population is 25,3020427 in Turkey. https://data.worldbank.org/indicator/SP.POP.0014.TO.ZS, The proportion of the population in the 0-14 age group is 23,6%, http://www.tuik.gov.tr/HbGetirHTML.do?id=27587

Table 3. Average Starting Age of Using Computers, Internet, and Mobile Phone by Age Group, 2013

	6–15 years	**6–10 years**	**11–15 years**
Computers	8	6	10
Internet	9	6	10
Mobile Phone	10	7	11

Source: http://www.tuik.gov.tr/PreHaberBultenleri.do?id=15866

Mobile phone use among children aged 6–15 years starts at age of 10 years on average whereas that in children aged 6–10 and 11–15 years starts at age of 7 and 11 years, respectively. Most children used mobile phones for speaking (92.8%), followed by gaming (66.8%), messaging (65.4%), and Internet access (30.7%). Among children of ages 6–10 and 11–15 years, 80% and 62.9% used mobile phones for playing games and 29.4% and 76.2% used them for messaging, respectively.

Table 4. Children's Computer, Internet, and Mobile Phone Usage by Age Group in Turkey, 2013 (%)

	6–15 years			**6–10 years**			**11–15 years**		
	Total	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**
Computer	60.5	62.6	58.3	48.2	49.7	46.8	73.1	75.4	70.6
Internet	50.8	53.7	47.8	36.9	38.3	35.4	65.1	68.9	61.0
Mobile Phone	24.3	26.1	22.4	11.0	11.0	11.0	37.9	41.0	34.5

***** Since more than one option can be selected, the sum may not be 100.

Source: http://www.tuik.gov.tr/

Computer, Internet, and cell phone usage by children of ages 6–15 was 60.5%, 50.8%, and 24.3% respectively. The corresponding numbers for children of ages 6–10 were 48.2%, 36.9%, and 11%, respectively, and those for children of ages 11–15 were 73.1%, 65.1%, and 37.9%, respectively.

Table 5. Proportion of Children Who Have Private Devices by Age Group, 2013

	6–15 years			**6–10 years**			**11–15 years**		
	Total	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**
Computer (Desktop (PC), Notebook, tablet, netbook vb.)	24.4	25.2	23.7	19.6	20.2	19.0	29.4	30.1	28.7
Mobile Phone (including smart phone)	13.1	14.2	11.9	2.5	2.4	2.6	24.0	26.0	21.9
Gaming Console	2.9	3.9	1.8	2.6	3.5	1.7	3.2	4.3	1.9
Nothing	68.3	66.6	70.1	78.5	77.4	79.5	58.0	56.0	60.1

Among children of ages 6–15 years, 24.4%, 13.3%, and 2.9% have private computers, mobile phones, and gaming consoles, respectively.

Table 6. Mobile Phone Usage Aims by Age Group, 2013 (%)

			6–15 years			**6–10 years**			**11–15 years**		
			Total	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**
Mobile Phone Usage			**24.3**	**26.1**	**22.4**	**11.0**	**11.0**	**11.0**	**37.9**	**41.0**	**34.5**
	Aim of Mobile Phone Usage										
		Calling	92.8	92.2	93.6	83.8	80.0	87.6	95.5	95.4	95.6
		Text (SMS or MMS)	65.4	65.0	65.9	29.4	29.4	29.4	76.2	74.5	78.2
		Gaming	66.8	71.8	60.7	80.0	85.0	74.9	62.9	68.2	56.0
		Internet	30.7	32.3	28.8	11.8	15.5	8.1	36.3	36.7	35.8

***** Since more than one option can be selected, the sum may not be 100.

Source: http://www.tuik.gov.tr/PreHaberBultenleri.do?id=15866

To teach fundamental skills, it is necessary to recognise the role of technology in learning; to revise schools' organization structure and administration as well as teaching, educating, and training; to make promote lifelong learning; to properly understand the role of the family; to provide better conditions and opportunities to teachers; to encourage families to educate their own children; and to increase information-based education opportunities. These are all necessary to reach higher computer literacy levels. However, the use of computers and the Internet by children shows that this is not the case in Turkey. There is no problem in terms of ownership when considering the digital divide; however, the issue of effective use is quite problematic.

4. CONCLUSION

Economic, social, and geographical borders impede the individual development of millions of children. The digital divide created among countries by the availability of Internet access can be significant. At the same time, it is also crucial for women, the disabled, and the elderly to benefit from new technologies. Training children in ICT in the future is vital to increase their living standards in the 21st century. Studies must investigate issues such as health, living conditions, access to clean water, good nutrition, environment quality, and child mortality rate; however, thus far, such studies remain inadequate. Worldwide, one out of every six children is engaged in child labour, which impacts them physically and psychologically and hinders their mental development. The long-term goal of countries must be to eliminate child labour.

Without educated youth and individuals, harmony cannot be achieved in global workforce requirements. Good high-paying jobs require education and training. According to the International Labour Organization's (ILO) estimates, although the global workforce (460 million) growth rate will decrease in the next decade, the number of people seeking jobs will increase. In particular, youth unemployment can be a problem in developing countries. Balanced regulations are required along with economic growth strategies. Countries facing the pressures of globalization and competition have to make investments to train and educate their workforce and to enhance their abilities.

ICT can create new jobs, increase productivity, and serve as a new growth engine, thereby offering various options to developing and industrialized countries in entering global markets. ICT is also effective for humanistic development fields such as providing healthcare, social aid, education, and experience. These technologies can affect our lives drastically. However, those who cannot directly access such technologies owing to geographical isolation, ignorance, and cultural borders will find it difficult to increase their living standards. Technology, on its own, cannot solve socioeconomic problems in countries. For instance, although India has gained stature worldwide owing to software development and ICT, poverty remains a problem.

In addition, the replacement of old technologies with new ones may not last long. Human experiences, habits, abilities, and new technologies may exist together in the long term for various reasons. If new technologies are used beneficially, their replacement will become simpler.

Many people worldwide have not yet even used a telephone. Efforts to address issues such as malnutrition and environmental problems are still underway. Although large amounts of information have become available, education is still lagging. Internet usage cannot impede ignorance on its own, and certain skills and abilities are required to access available information. It is necessary to benefit from global information and experiences to achieve certain goals such as reducing poverty.

Healthy democratic societies require educated and learned citizens to thrive. The ability to adopt, organize, convert, and deliver information worldwide is greatly influenced by ICT. Computer and ICT literacy gained through education are therefore quite important.

Computer literacy is as important as being well-off economically. Internet access is increasing and, in parallel, new technologies are being developed swiftly. As economies transition to information economies, the importance of information and information literacy is increasing gradually to compete globally.

As a result of these developments, many manufacturing industries have disappeared and new professions requiring computer literacy have emerged. Lifelong learning has become increasingly important to keep improving old skills and learning new ones.

There is a digital divide between industrialized and developing countries. ICT expansion can create differences between the prosperity and income levels of countries. Viewed optimistically many "digital opportunities" currently exist. Globalization may help to reduce the digital divide. With free access to technology across borders, this may be achievable. However, there are certain limitations to the easy availability of technology. For example, factors such as developing countries' infrastructure, ICT availability, and income may be limiting factors. Therefore, children and youth should be supported and encouraged to realize their potential. Companies such as Facebook and Google are the best examples of what the youth can create to achieve real change.

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