

Inequalities in the era of Knowledge

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Abstract: Information and communication technologies (ICT) are leading our society to the era of Knowledge. This will be an era where the acquisition and management of Knowledge will not be a privilege for a small portion of people but for everyone, laying the foundations for a more democratic society. But, a prerequisite is everyone to have equal opportunities for access and use of ICT. This paper is a reference to reasons that create the digital divide between genders, to the results of a preliminary survey on gender differences concerning computer access and time of use of preschool children in Greece as well as to pedagogic implications.

Keywords: gender, gap, computer, preschool, education, children, Greece

1 Introduction

ICT can contribute to the creation of a democratic society where every individual will equally have access to knowledge, information and consequently the labor market. New Technologies also can be a factor for the economic development of all the nations. All the aforementioned will happen only if everyone has equally access to computers and the related technologies and if everyone has the skills to use relative technology. Even though computers and more generally ICT have become very common home equipment, according to the literature, differences between persons concerning access, types of use and attitudes still can be detected. The digital divide still exists and it concerns many facets of the social and individual life. Like age, gender, being a person with special needs, socioeconomic status and years of education. So digital divide is a multidimensional concept and is not related only with the access or not to the digital equipment. The reasons for all these different digital "gaps" vary depending on the reasons that create them and sometimes are not directly related with computers and technology but stem from the same grounds that create the differences in other domains of the social life. So they are overlooked as not being related with computer. This way no solutions can be found and the situation is not changing.

This paper is a reference to the reasons that create the gender digital divide. Furthermore, results of a preliminary survey which took place in Greece and was conducted by the second of the

authors will be presented aiming to uncover factors that could affect an intervention program which has been developed for young children and children with special needs. More generally this paper is a reference to factors that could be a cause of misuse of digital technology in school or other settings and reduce the benefits that may have the implementation of the ICT in our lives.

2 ICT and gender inequalities

In our era, that computer related technology is so widespread, international survey results, shed light on the fact that there still are differences between men and women and technology. These differences concern the percentages of access and use of computer and technology related knowledge, the attitudes about computer, the enjoyment they experience when they are working with new technologies, the proportion they participate in school computer labs, the subjects they attain in college and as a result of all the abovementioned their participation in the labor market with jobs where high technology skills are required [1], [2], [3].

As has been published by Eurydice [4] almost all students who are 15 years old have used computer at school, house or somewhere else. But boys show significant superiority in the years since they have been using it, the weekly frequency of use and the type of use. Boys use it more often for high demanding activities as programming, music downloading or graphics programs. Also boys

assess themselves to be more competent when they are engaged doing more difficult technology related activities.

Furthermore, according to the Eurobarometer Flash 95/102 survey [5], "On the teachers and the information society" with target all the teachers for children and pupils aged from +/-6 up to +/-18 year old, a greater proportion of male teachers use computer and internet, men use more often computer and internet for school activities and for longer time, communicate more often with schools on international base while a greater proportion of female teacher declare that they do not use internet because they do not know how. More women than men have neither a computer nor internet connection at their home. From the teachers who are teaching computing as subject 61% are men and only 39% are women. In 2004, less women than men had Internet access in most OECD countries except Finland and United States that more women were connected than men [6]. The most interesting thing about the gender inequality regarding the use of computer and ICT is that the gap is broadening as children grow up. Girls seem to enjoy more than boys using computers when they are younger something it changes in favor of boys later in school and college [7].

3 Factors creating the digital gender gap

It is obvious that the digital gender gap is a reality. As it can be concluded, from the Eurydice results and international surveys, it is associated with the majority of nations that technology has been applied. Which are the factors that contribute to the creation of that gender inequality? According to the literature and the international research results these factors can be synopsized in two main categories, which are, socialization procedures and access to computers and ICT.

3.1. Socialization procedures

Socialization procedures and stereotypes are important factors which gradually lead the females to feel less competent as it concerns new technologies and creators of the "we can, I can't" [8,9] paradox. According to this paradox when women are asked if *women* are capable to use computers they answer that they are, but when they are asked if themselves are capable to use computer or technology they answer that they are not.

A key factor is the stereotype that computer and generally technology is a male domain where men are more capable or efficient to work with it. That is a stereotype believed by parents, teachers as well as male students of technological institutions.

Moreover technology is being correlated with mathematics a domain which is also positively correlated with man. According to survey results [10] fifteen year old girls even though they are not less competent than boys they declare that they do not feel capable enough with mathematics.

3.2 Access

Another important reason which possibly is correlated with the way boys and girls are being socialized is the access. Boys have far more possibilities to use a computer in other settings than school and family. Boys also start using it when they are younger, they use it more often than girls do and finally they use it for more creative activities [4].

3.3 Consequences related with the originating factors of the digital gender gap

The abovementioned basic factors which contribute to the creation of the digital gender gap have many other linked consequences, which eventually, reinforce the basic factors giving boys an advantage as it concerns their participation in technological colleges and institutions and finally in the labor market.

Because boys work more time with computers gives them extra exercise and familiarization with new technologies. This in turn is giving boys the feeling that they are more competent with computers, that they can complete a task efficiently and makes them feel high self efficacy as it concerns tasks requiring computer skills. Self efficacy is the belief that someone has about his abilities to complete a task and to overpass difficulties related with it [11]. Furthermore, girls since they work less with computer have less experience than boys. So when girls finally use it are being confronted with more technical problems and so they enjoy less than boys working with computer and technology, they feel less self-efficacy and finally, as the surveys reveal, as they grow up participate less and with less creative ways in our digital world.

So, it can be concluded that the digital gender gap constitutes a circle, "The circle of the gender digital divide" [Fig.1] without a start or a finish point.

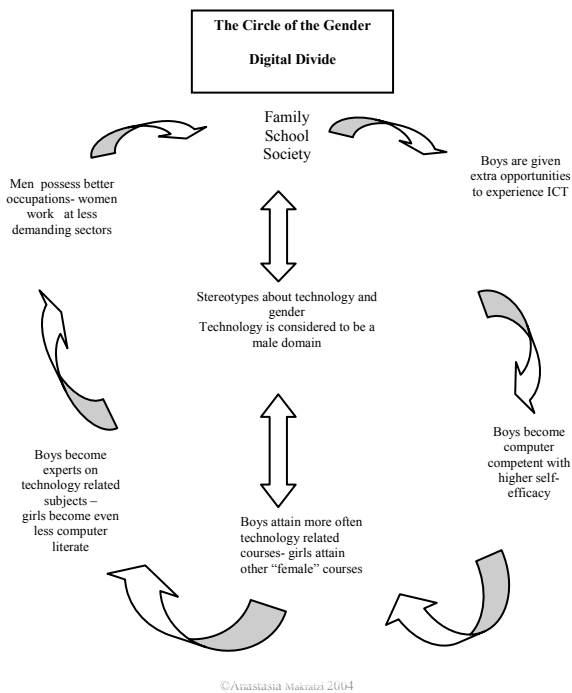


Fig. 1 The circle of the gender digital divide

4 Our survey

In the era of knowledge, to be someone digital or computer literate is an important prerequisite for the participation in the social and economic life. The gender digital gap can become a reason for women exclusion from the social development.

The main body of the research investigating the relation between gender and ICT has as a target population children of primary school and older, students of technological institutions or adults. It would be interesting and revealing to search if these differences between male and female apply to younger children. So interventions programs could be designed in order this gender gap circle to be broken.

Having this in mind and with scope to investigate gender differences which could influence the results of a computerized intervention program for young preschool children and children with special needs, a survey was conducted.

4.1 The method

In order to collect the information we were interested about, questionnaires were handed out to parents of preschool children. The questionnaire had to be completed and to be brought back to schools. The target of this preliminary survey were parents of 70 preschool children aged from 5;4 year old and mean of age 5;10 who were selected to participate in the intervention program.

The families were chosen from all social, economic and educational backgrounds.

4.2 The questionnaire

The parents had to give demographic information and then answer questions, among others, asking if they have computer at home, if their child/children were using it, and if the previous answer was positive how many hours is h/she occupied with it. Additionally children were asked by the researcher if they use a computer.

4.3 The results

A significant number almost 80% of questionnaires were brought back to us by the parents.

The proportion of boys in the sample was up to 59% percent.

According to the survey data which was collected in 2004, almost 50% of our sample households do not have computer, (Fig. 2).

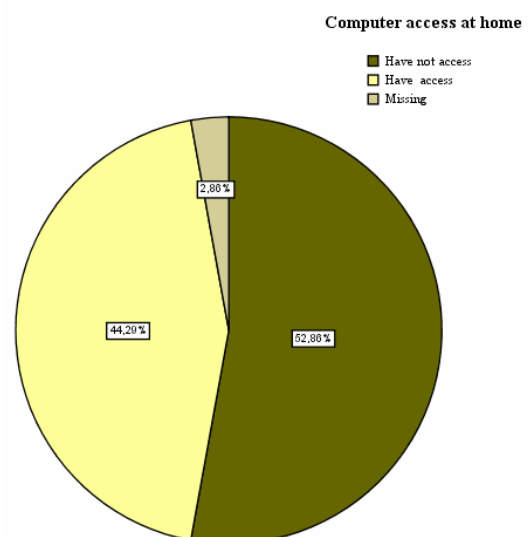


Fig. 2 Computer access at home

From those that have access to a computer 68% of the families with boys have not whilst only a

32,4% of the families with girls have not access at their home to a computer. As we can see when children are young more girls have access to a computer at their home (Fig.3).

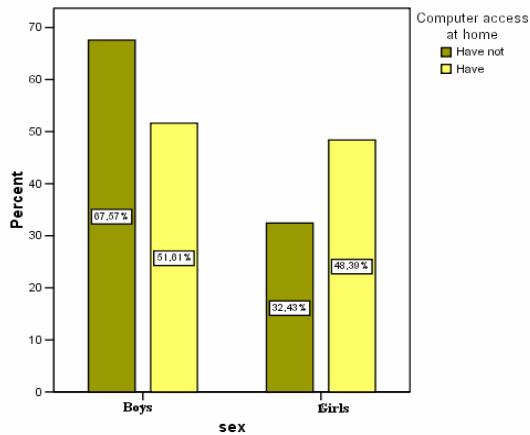


Fig. 3 Computer access at home by gender

When children were asked if they have ever use computer 56,1 % of the boys answered that they have not while only 44,4% of the girls answered that have not use a computer, a non statistically significant difference (Fig. 4).

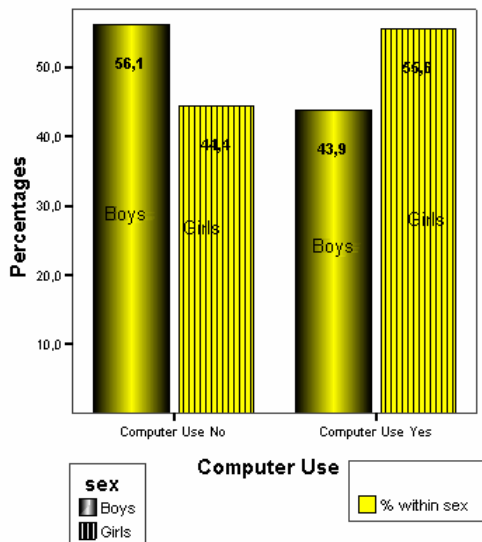


Fig. 4 Computer use by gender

Furthermore, from the preschool children that have access to a computer at home only a very

small proportion of 6,5% do not use it which is equally distributed to boys and girls Not statistically significant difference was found between boys and girls as it concerns the use of the computer.

Even though, the differences between boys and girls from different socioeconomic-educational status as it concerns if they have or not use a computer are not statistically significant, the differences between the different status and use of computer are statistically significant in favor of the higher socioeconomic-educational status, which was classified according to the occupation and years of education of the parents. Up to 87% of the children that belong to the higher status have use computer in contrast with children from the lower that only 17% of them have use a computer (Fig. 5). This is revealing another digital divide which has to be taken in consideration when programs are being designed concerning the implementation of ICT at school.

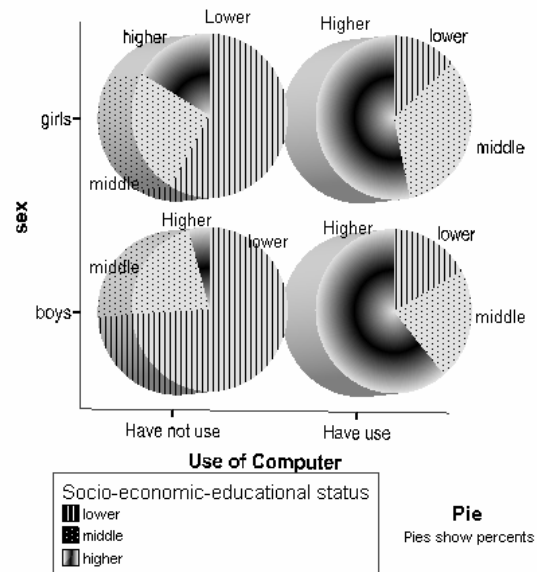


Fig. 5 Socioeconomic-educational status, gender and use of computer

As it concerns the time of use, boys use computer for longer time than girls do. Almost 87% of boys use computer from 1 to 4 hours when only a 60% of girls use it for the same time (Fig. 6).

5 Conclusions

Even though the differences are not statistically significant tendencies can already be observed. Preschool girls have more often access to computer

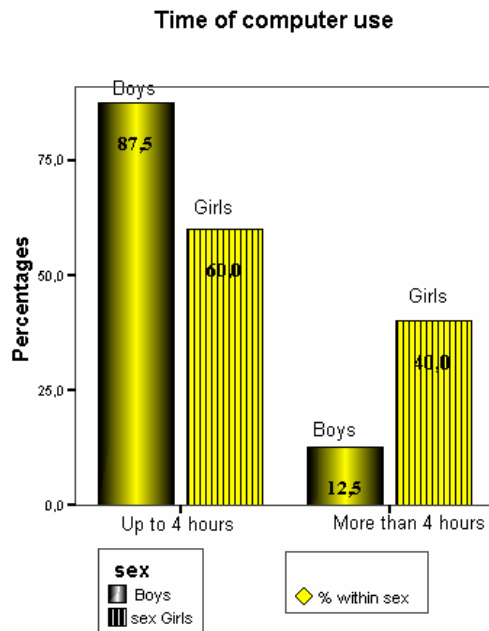


Fig. 6 Time of computer use by gender

and a higher proportion of them use it. But boys of the same age use it for longer time. This already provides boys with an extra experience which in the future could give them a higher self efficacy, make boys more competent than girls as it concerns the use of technology, more inclined to be engaged with technology activities, and finally enjoying using computer while they participate in creative ways for the advancement of themselves as well as the progress of their countries.

6 Limitations and perspectives

Our results even though are consistent with results which concern proportion of computer access with international researches including Greece and with previous survey [3] concluding that do not exist gender differences between young preschool children can not be generalized to a national level because of the small sample. But it can be concluded that generally statistically significant

gender differences do not exist when children are young.

The results from this point of view are important as they can give guides for teachers, caregivers and further research.

Teachers of all the educational levels should be informed about the multidimensional concept of the digital divide and to understand that the gender digital gap is not an inevitable result. The implementation of ICT in the school environment is not just a matter of digital equipment. Teachers should be informed that with psycho pedagogical procedures that take in consideration the individual differences early in the childhood and through cooperation with parents the gender digital differences can be eliminated.

More over, longitudinal researches have to be conducted and policy makers should take in consideration the results if they want to contribute to the creation of a school which will respect diversity and will give every individual the opportunity to acquire and manage knowledge and to be creative for himself as well as for the society.

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