Media education and digital divide in the knowledge society

INTRODUCTION

Information and communication technology (ICT) is playing a central role in the development of modern economies and societies. Every young person will need to use ICT in many different ways in their adult lives, in order to participate fully in a modern society. This has profound implications for education, both because ICT can facilitate new forms of learning and because it has become important for young people to master ICT in preparation for adult life. But is ICT living up to its potential in schools and in the lives of young people? To start to answer this question, the extent to which young people are exposed to and making use of such technology and whether those who do so are achieving desirable learning outcomes must be determined.

In this paper we analyse the impact that the information communications technologies are having on the training of the youths. Also it will be analysed the unequal access to the ICT depending on factors such as gender and family origin. To carry out the analysis, the source has been the PISA Report 2005, from the OECD.

THE EQUAL OPPORTUNITIES AND THE DIGITAL GAP IN THE SOCIETY OF THE KNOWLEDGE

In the sixties and the eighties, many researchers published different works on the transformations that began to emerge in the so denominated ‘new society of the knowledge’ (Touraine, 2005, Bell, 1976, Giddens 1979; Castells, 1986, 2001). One of the main characteristics that defines the post-industrial society is the change that took place in the processes of social and occupational stratification. The positions occupied in the social and occupational structure are determined partly by the unequal access to the professional and technical knowledge that are acquired in the education system and in the family environment.
In the industrial society, the high education exclusion -the fact of not entering the University-, often located below their expectations or punished (in terms of the labour market access) to those that didn't have good qualifications. That is to say, the equality of opportunities was analyzed depending on the factors that explained the scholastic failure such as the social class where people come from, the gender or the ethnos (Bourdieu and Passeron, 1980 Bowles and Gintis, 1983). The new society of the information and the knowledge is characterized to be a ‘net society’ that has been defined ‘as the group of interconnected nodes [...] What a node is depends on the type of nets to that we are referring to’ (Castells, 2001: 550). The new structure of the net society is composed by nets of production, power and experience that have given place to a new culture of the global, no without contradictions. This net society means a qualitative change in the human experience. The information becomes a key factor for the social organization and the social stratification, to such an extent that new processes of social inequality linked with the access to the ICT are taking place.

In the post-industrial society, the training and the knowledge of the ICT have entered as new forms of social inequality associated with traditional factors as the social class and the gender. That phenomenon has been denominated ‘digital gap’, as the differential access to the ICT increases the social duality among the different social strata.

The concept of 'digital gap' makes reference to the ‘strong inequality that arises in the post-industrial societies among those that can access to the new information communications technologies (ICT), integrating its use in the daily life, and those that are not able to or don't know how to access’ (Ballesteros, 2003: 1). This new form of inequality that is taking place in the current society can even increase the social exclusion of some population's sectors in function of factors such as the social class of origin, gender, educational level, ethnos, etc.

To be able to access the net it is indispensable to have a series of infrastructures and knowledge. In this work the unequal access to the ICT will be analysed through factors such as the gender and the economic status in the OECD countries, starting out from the analysis of data in the PISA Report 2005. This unequal access impacts in the attitudes that youths have towards the new information communications technologies as well as in their educational performance, what is therefore generating new processes of social exclusion in what has been called the ‘digital gap’.

**RELATIONSHIP BETWEEN ACCESS TO COMPUTERS AND STUDENT’S GENDER AND SOCIOECONOMIC BACKGROUND**

The studies carried out have shown the existence of differences in the access to the new ICT depending on factors like gender, socio-economic status of the students.

To what extent do different groups of students – males compared to females, for example, or those students with higher or lower socio-economic status – have different access to computers?.

According to PISA Report 2005, gender differences in access to computers at home appear in two-thirds of the countries participating in the ICT survey. Male students are more likely to have home computers available than females in 20 countries. In nine of these countries the difference is five percentage points or below, but in Greece, Poland,
and the partner countries Latvia and the Russian Federation, it is between 11 and 14 percentage points. In contrast, males and females have largely the same degree of access to computers at school, and in the only countries with a gender gap of around five or more percentage points, Belgium, Ireland and Korea, the difference is in fact in favour of females. In 17 countries, males are significantly more likely to have access to computers in places other than home or school, and this difference is as high as 20 percentage points in Turkey, 10 in Italy, and 15 and 11, respectively, in the partner countries the Russian Federation and Serbia. In two countries, Ireland and the United States, females are more likely to have access to computers in other places than home or school.

Socio-economic background is a stronger predictor of whether a student had access to a computer at home than is gender, and here again the differences at school and in other places tend to be much smaller than socio-economic differences at home. The data of PISA Report (2005) shows these differences by dividing the student population of each country into four equal-sized groups, according to their ranking on PISA’s index of economic, social and cultural status (ESCS). In most countries, students from the least privileged quarter of the population by socio-economic background are significantly less likely to have a computer available at home than those in the most privileged quarter. This socioeconomic digital divide is starkest in countries where the fewest students overall had home computers access, such as Mexico and Turkey, and the partner countries the Russian Federation and Thailand, where 11% or fewer students in the bottom quarter by socio-economic status can access home computers, compared to at least 70% in the top quarter. However, even in some countries with high overall rates of access, this disguises wide socio-economic differences. For example, 87% of students in Italy have computers available at home, but 33% of those in the bottom quarter by socio-economic background lack this resource, compared to just 2% in the top quarter. On the other hand, some countries have near-universal access in all socio-economic groups: at least 90% of students across the socio-economic spectrum have computers at home in Austria, Denmark, Iceland, Korea, Sweden and Switzerland, and the partner country Liechtenstein.

In many countries, there are no large differences in access to a computer at school among students from different socio-economic backgrounds. However, in Mexico and the Slovak Republic, and the partner countries the Russian Federation, Tunisia and Uruguay, the percentages of students from the bottom quarter having access to a computer at school are more than 10% lower than those from the top quarter. This variable pattern across countries also applies to access to computers in places other than home or school, although here some countries have more substantial differences by background. In the partner country Tunisia, such computers are available to 81% in the top quarter, but only 28% in the bottom quarter. The gap between the top and the bottom quarters is between 20 and 35 percentage points in Mexico, Poland and Turkey, and the partner countries the Russian Federation, Thailand and Uruguay (PISA, 2005: 94).

ATTITUDES TOWARDS ICT, STUDENT’S GENDER AND SOCIOECONOMICS BACKGROUND

Comparatively, students in Austria, Canada, Germany, Iceland, Korea, Poland and Portugal, and the partner countries Liechtenstein, Serbia and Tunisia, express more
positive attitudes towards computers, whereas students in Denmark, Finland, Hungary, Ireland and Japan, and the partner country Latvia report slightly less positive attitudes (PISA 2005:107). In all countries except Japan and the partner countries Thailand and Tunisia males report more positive attitudes towards computers than do females.

There are quite clear gender differences on the indices of confidence in routine tasks, Internet tasks and high-level tasks. In the majority of countries, males report far higher confidence in all three categories of ICT tasks (PISA, 2005: 107). However, the largest differences in favour of males are found with regard to confidence in performing high-level tasks, and these exist in all countries except Thailand. In particular, far fewer females in the Czech Republic, Denmark, Finland, Germany, Iceland, Poland, Sweden and Switzerland, as well as in the partner countries Latvia and Liechtenstein, report being confident in performing high-level tasks on a computer, with a difference of at least 0.60 index points in favour of male students (PISA, 2005:113).

PISA report (2005: 108) shows the proportion of all higher academic qualifications (ISCED 5A/6) awarded to females in 2003, and this provides a snapshot picture of educational choices of previous cohorts of school students. This picture mirrors the gender difference in the reports of confidence among today’s 15-year-olds. On average only 24% of university-level and advanced research qualifications in computing were awarded to females. In contrast, when considering all fields of study, 56% of higher academic qualifications were awarded to females. Some countries have much lower gender gaps in terms of computing qualifications. Between 39 and 42% of higher academic qualifications in computing are awarded to females in Finland, Korea, Mexico and Sweden. Yet these four countries show a striking contrast in gender gaps in the confidence of 15-year-olds in ICT use, as shown in PISA. The gap is quite moderate in Korea and Mexico. In Finland and Sweden, on the other hand, students’ self-reports in PISA 2003 reveal very large differences in levels of confidence between males and females, despite the relatively high participation of females in advanced computer studies. In contrast, only 15% or fewer of the higher academic qualifications in computing were awarded to females in Austria, Belgium, the Czech Republic, Germany, the Netherlands, the Slovak Republic and Switzerland (PISA. 2005: 116).

EQUITY OF ACCESS TO TECHNOLOGY AND STUDENT PERFORMANCE

In many countries schools play an important role in providing more equitable access to technology. While in six OECD countries at least one in five students still lack access to computers at home, in only one country. But to what extent might school access reduce any performance differences associated with inequitable home access?

KEY POINTS

• The minority of students who still have only limited access to computers performed below the OECD average in PISA 2003. In particular, those without access to computers at home are, on average, one proficiency level below the OECD average. In most countries this effect remains even after accounting for socio-economic background of students.
• Students with the shortest experience of using computers scored poorly on average in PISA 2003. Those with less than a year’s experience can typically perform only the simplest mathematics tasks.

• Students who use computers least frequently at home also performed below average in PISA 2003. However, students using computers most frequently at school do not in all countries perform better than others. Looking at the frequency with which students use computers for a range of purposes, the highest performances in PISA 2003 were seen among those students with a medium level of computer use rather than among those using computers the most.

• Students with low confidence in their ability to undertake routine tasks on the computer or to use the Internet performed much lower in mathematics in PISA 2003 than did the most confident students.

The analysis makes an important distinction between the use of computers in the home and at school. Previous studies have demonstrated that home use of computers is most strongly correlated with higher academic achievement (Ravitz et al., 2002; Harrison et al., 2003). However, the relationship between use of computers in school and achievement is more ambiguous and some early correlational studies found a negative association (Ravitz et al., 2002; Papanastasiou et al., 2003; Wenglinsky, 1998). A complication in making such comparisons, at school in particular, is that weaker students may be more likely to be given computer-aided instruction, so a negative association with performance when looking at the whole student population is not inconsistent with a positive effect of such instruction for individuals.

To what extent can these performance differences be interpreted as merely reflecting the fact that students without computers at home tend to be disadvantaged in other ways, in particular by their socio-economic background? In all countries with data, the use of either a computer or the Internet is significantly and positively correlated with the head of household’s educational attainment (OECD, 2004a), while parental education background correlates strongly with performance. Do performance differences associated with computer access disappear when accounting for such socioeconomic background characteristics? This can be calculated in PISA using its index of economic, social and cultural status (ESCS), based on student reports of their parents’ occupational status, educational level and cultural possessions at home. In fact, once accounting for socio-economic background the performance advantage associated with home computer access remains in 23 of the 31 countries with data available. These performance differences, which are typically between one third and one-half as great as before controlling for ESCS, remain above 30 score points (around one-half a proficiency level) in Australia, Belgium, Germany, Korea, Switzerland and the United States, and the partner country Thailand (PISA, 2005: 118).

According PISA Report 2005 report thus even though more students have access to computers at school than at home in most countries, it is not clear that this school-based access has an effect strong enough to compensate for the effect of lacking a computer at home. If it did, larger performance differences between those with and without access at school might be observed, although such an effect could be hard to measure if lower-ability students had greater access to computers for some purposes.
In short, the studies carried out on the access to the new technologies and the unequal use of the educational opportunities have shown that the ICTs mean innovative learning devices that at the same time become barriers usually difficult to overcome. Therefore, we are facing new forms of inequality in reference to the equality of educational opportunities that are related with the possibility of accessing to the new knowledge technologies in the so called societies of the knowledge (UNESCO World Report, 2005; Ríos Mauro, 2003; Serrano and Martínez, 2003)

CONCLUSION AND IMPLICATIONS

In most OECD countries and in some partner countries in the PISA 2003 survey, the great majority of 15-year-old students have ready access to computers, at home and at school. In a world in which computer access has become an essential prerequisite for full participation in society, and where computers have an integral role in learning, the main concern is whether some groups of students are being left behind. Students who lack access are unable to use what has become an essential educational tool.

In this context, the disadvantage in terms of differences in resources to support school learning that some students face in their home environments varies in its nature from one country to another.

In the past, the presence or absence of books at home to support school learning seemed to play an important role, and has been highly correlated with educational outcomes. Today, in some countries, socio-economic background is a stronger predictor of whether students have computers than whether they have books available to support schoolwork at home, and responses to social inequalities need to be adapted accordingly.

Also there is a visible gender gap, but while gender makes a difference here, it is not the principal determining influence. In contrast, when it comes to using computers for high-level tasks such as programming, the gender gap is wide. The more advanced the task, the wider the gap. This is important not just because it will mean that fewer females may be inclined to go on to advanced studies in computing, but also because it suggests that females may be more hesitant to stretch their usage of computers as a tool. A strategy for reducing this gender difference would need to concentrate on building females’ interest and confidence in computer usage itself, helping them to see how ICT can be used flexibly as a learning tool, rather than coaching females in the use of familiar functions, which they have generally already mastered.

These results show that some features of ICT availability and use are strongly associated with student performance, but that this is not true of all such features.

One thing that is now clear is that in an age in which computers feature strongly in everyday life and in education, the minority of students who have little access to them, who use them little and who are not confident in using ICT are not performing well. This is partly because students with low home access are more likely to come from disadvantaged backgrounds, but the observed gap cannot nearly be explained by socio-economic status. Thus, the disadvantages faced by students whose parents have low educational or occupational status are likely to be exacerbated where they also do not
have access to computers. The PISA evidence confirms previous studies showing the particularly strong association of performance with home access and usage.

Usage at school may help to compensate for this disadvantage, although the relatively weaker association between school access/usage and performance raises questions over the extent to which it can fully compensate.

While this evidence therefore underlines the importance of bridging a technological divide that still leaves some students marginalised in terms of computer usage, a harder question is to what extent extending the usage of computers within schools can contribute to higher standards and greater equity in student performance.

In conclusion ICTs are a significant factor in the current trend of cultural and economic globalisation. Over the last few decades, vast resources have been invested to extend the reach and application of ICTs. Proponents of this ‘information revolution’ cite potential benefits in a wide range of areas and many hope that ICTs will have a positive impact for gender gap and inequality reduction. This hope has been encapsulated in the phrase ‘the digital divide’. However, some commentators have expressed concern that effective exclusion from the information revolution will exacerbate the inequality of many in the education. This concern has been encapsulated in the phrase ‘the digital divide’.
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