Understanding digital divide as a form of cultural and social reproduction

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Abstract

This paper presents When it comes to the digital divide, Europe is a mixed bag. The digital divide touches all regions of the world and threatens the goal of an all-inclusive information society. This paper examines a few aspects of the digital divide, such as social factors, including but not limited to income, education and literacy. The article shows the impact of symbolic-capital theory of Pierre Bourdieu proposing an analytical framework for statistic data supposedly related to the concept of digital divide. Finally good practices are discussed.

Keywords: social reproduction, inequality, education, inclusion

1 Introduction

Education through ICT subsequently has turned into the most fundamental resource a nation can offer to its citizens. But technology in education is not always an advantage. Digital divide describes this disadvantage and explains the difference in access to and practical knowledge about the use of information technology, specifically the Internet.

2 Research Findings about Digital Divide

The origin of the concept dates back to the 1990s and it gained publicity through a series of surveys conducted by the American National Telecommunication and Information Administration which were presented in the *"Falling through the Net*" reports (1995, 1998, 1999, and 2000). Other studies have taken a more specific perspective, such as Keil (2005), who explores the divide in terms of a *digital generation gap*. The second perspective is related to spatial variations. Such research may focus on the *rural–urban dimension*. Warren (2007), for example, investigates how the Internet influences social marginalization of disadvantaged groups in rural areas of the UK and reaches the conclusion that a new media structure can be followed by social exclusion. The use of technology is an approach that is also visible in other geographical approaches to digital technology. Graham (2005), for example, explores how surveillance technology contributes to the social segregation.

For identifying and measuring differences that exist within the digital divide, the main indicators have typically been *private ownership of computers* and *the use of Internet* (for example: Bradshaw et al. 2005; NTIA 1995, 1998, 1999, 2000; Tien and Fu 2008; Tiene 2002). Another research has been made by Wilson (2006), who identifies eight aspects of the divide: physical, financial, cognitive, design, content, production, institutional, and political access. Another approach has been to focus on the concept of digital literacy and by so doing the aim is to gain a deeper understanding of *ability to handle digital technology* (Livingstone 2004). Others, such as Warschauer (2003), have criticized the concept for its *technological determinism* and argues that the inequality that exists is social not digital. However, many researches show that,

particularly within lower-incomes populations, ethnicity is still related to less frequent use of the Internet. While economic structures related to class are crucial in limiting access to media, both in theory (Mosco, 1998) and in recent empirical work (NTIA, 1999; Strover and Straubhaar, 2000), culture, as indicated *by ethnic differences*, is also still very important. Researchers have addressed the intersection of technology and social groups. Most of these groups fall under general categories like: the socially excluded; the extreme poverty groups; the marginal and geographically remote; the indigenous population; the linguistic and ethnic minorities; the groups with special needs and disabilities.

Badagliacco (1990) *discussed the intersection of gender and racial factors* in impacting the disposition towards the use of computers. Using mail questionnaires at a large public university in New York City, he illustrated that men and Whites had both the most computer experience and positive attitudes towards computers, and that computer-related practices are perceived as white and male-dominated activities.

The breadth of this digital divide literature was recently illustrated in a comprehensive systematic review of 192 English-language research reports by Liangzhi Yu (2006). This analysis confirmed the following factors as emerging from the recent literature as associated with *the non-use of ICTs* within countries:

1. Income/socio-economic status	Lower levels of income are consistently shown to be associated with digital divides concerning access to and use of a range of ICTs
2. Education	Lower levels of education are also shown to be associated with digital divides concerning access to and use of a range of ICTs.
3. Family structure	Family composition, adult caring responsibilities (ie for an older parent) tend to be associated with less contact with ICT. Conversely, the presence of school-age children within the household tend to increase contact with ICT.
4. Age	Increased age is associated with decreased levels of access, limited modes of use and patterns of connecting. Age differences are especially pronounced in those individuals aged 60 years and over.
5. Race	Some US studies report lower levels of access and use amongst African-American and Latino populations. However, many studies report that then racial differences in ICT use disappear when issues of income and education are taken into consideration.
6. Gender	Whilst gender differences were associated with digital divides during the 1990s, more recent academic research seems to indicate declining gender differences in ICT access and basic levels of engagement
7. Geography/ rural-urban location	Levels of ICT use generally less in rural and inner-city areas, although often differences are not evident once other socio-economic variables are taken into account.
8. Culture/social participation	Communities and individuals with higher levels of social contacts tend to make more use of ICTs.

Table no. 1. *Digital Divide Factors*
Source: Key Data on Information and Communication Technology in Schools in Europe, 2004, Eurydice.

3 Associated Concepts to Digital Divide

Despite the increasing attention and academic literature on the digital divide, many concepts are not so clear, so we mention in this article a few:

1. Digital Inequality: A new form of inequality springing from the digital divide in which those denied access to or practical knowledge of information technology suffer from political, social, or economical disadvantages as a consequence of that exclusion.

2. The Demographic Digital Divide.

Although it is important to recognize the possibility of an expanding digital divide comprised of the information "haves and "have not's", some studies show that the digital divide is actually decreasing with time. This makes sense from the standpoint of market economics.

3. Social Position: Social position describes a person's place in the social hierarchy and plays a significant role in determining one's employability, employment, and income.

4. Socioeconomic Status (SES): Social position measured by income, education level, and occupation.

5. Stratification: Stratification can be described as the structural hierarchy on which education, class, and other class and social hierarchies are constructed.

6. Tracking: Tracking can be described as the separation of students into hierarchical learning groups based on perceived or measured ability.

4 Cultural Capital-Economic Capital

The poverty and social class issues can be described in terms of access to *cultural capital* or symbolic capital, a theoretical conception originally formulated by French sociologist

Pierre Bourdieu (1986). Cultural capital is defined as the possession of certain cultural competencies, bodies of cultural knowledge that provide for distinguished modes of cultural consumption. Bourdieu argues that in modern societies, the accumulation of cultural capital requires a long-term investment of time and education. Although they are not reducible to each other, economic and cultural capital is convertible to one another (Johnson, 1993*).*

According to Bourdieu's theory, members of a lower social class have little or no opportunity to acquire the traits, habits, or information necessary to accomplish a rise in status, income, class, or livelihood. In case of the digital divide, a lack of cultural capital would make it much harder for children born into low social classes to gain the knowledge necessary to command information technology. The discussion of the digital divide so far has taken a structural point of view.

5. Measuring the Digital Divide- Romania in Statistics

The so-called "digital divide" raises a number of questions. Where does it occur and why? How is it to be measured? What is its extent, that is, how wide is the digital divide? These questions have only recently been raised, and it is not possible, as yet, to answer all of them with any certainty.

Because of the current interest in these issues, both among governments and the public, the OECD has begun efforts to measure the digital divide. One of the key findings from a recent report by the OECD (2009) was that "*the digital divide* that separates those with the competencies and skills to benefit from computer use from those without*."* The OECD warning about a 'second digital divide' is perhaps not noteworthy in 2010 for its novelty or newness.

An IEA study explores the relationship between achievement and the use of ICT, is the mathematics part of TIMSS-1995. A quite peculiar finding from TIMSS-1995 was that it appeared that students who used computers frequently for mathematics learning had lower scores than the students who hardly or never used computers for this purpose. Pelgrum and Plomp (2002) showed that these achievement differences could amount to an equivalent of 2.3 years of schooling (see Table 2).

Country	High ICT -Low ICT	Upper grade–Lower	Years behind
Canada	-50	33	1.5
Cyprus	-48	28	1.7
Denmark	-23	39	0.6
Greece	43	44	1.0

Iran, Islamic Rep.	33	29	1.1
Japan	-8	34	0.2
New Zealand	-66	37	1.8
Philippines	-31	13	2.3
Romania	-15	27	0.6
Sweden	-65	36	1.8
Thailand	-13	25	0.5
England	-56	31	1.8
Scotland	-45	35	1.3
United States	-47	22	2.2

Table no. 2. *Differences in achievement between groups with high and low ICT use, and upper and lower grade, and number of years high ICT use group*
Source: Achievement score difference (Pelgrum&Plomp, 2002)

Let me illustrate now the characteristics of our endeavors through briefly describing the essential features of the Swedish and *Romanian* model for the dispersion of ICT culture. In Sweden, you find no significant differences between the number of computers possessed by university degree holders and blue collar workers. In *Romania*, however, the level of education will define if you own a PC or not. Digital culture, apparently, may increase or decrease social differences and thus bridge or widen the social – cultural – digital divide. Through its *EURO200* programme, the *Romanian* government has concentrated efforts on getting poorer school children pupils from families with low income equipped with computers at home. So far more than 150,000 pupils have bought a computer under the programme. Since Romania acceded to the EU in January 2007, the government sees ICT as an essential component in helping to modernize the country's economy.

Researches shows that among 16 to 24 year olds the proportion of computer or Internet users is three times higher than among persons aged 55 to 74. A similar degree of inequality is observed when comparing persons with higher education with the less educated. In many European countries in the year 2000, pupils aged 15 attended a school that on average had at least one computer for 20 pupils. Seven countries (Denmark, Luxembourg, Finland, Sweden, the United Kingdom, Liechtenstein and Norway) are characterized by a ratio even lower than 10. On the other hand, in Bulgaria and Latvia, there are at least 30 pupils per computer and in three countries (Greece, Portugal and *Romania***)**, over 50.

Another statistics are useful:

- *Today all students in OECD countries are familiar with computers*

On the whole, less than 1% of 15 year-old students in OECD countries declare not to have used a computer at all. In the light of the progression done since 2000 it may well be expected that this remaining 1% will have faded by now. The percentage of families connected to the Internet is always lower than that of families with a computer.

- *Frequency of use at home is unparalleled by school use.*

In most OECD countries more than 80% of them are using computers frequently at home, while when it comes to school use the majority of students do not use them –with the exception of Hungary. The increase since 2003 has been equivalent both in home and school use, but the difference remains significant.

- *Despite increasing investments in ICT infrastructure in schools, ratios can be still regarded as a handicap for higher ICT use in schools.*

School computer rations have not improved since 2003. The OECD average ratio of students per computer is 5. This ratio has dropped by 50% since 2000, when the ratio was 10 students per

computer. Moreover, this raises the issue of the difficulties associated with the lack of data about expenditure on technology in education.

- *Digital media are increasingly used as educational resources, but there are large disparities across countries.*

As access to digital media at home increases, the importance of books as tools for coursework decreases. Interestingly enough, this does not seem to favor educational software at all, but rather the Internet. In most countries educational software is the least frequent resource at home.

- *The prevalent use of computers is related either to the Internet or to entertainment.*

Word processing and information search facilities are also used by children to a lesser extent. These two categories present rather similar percentages (31.5 % and 33.6 % on average respectively). For these two types of computer use, the highest rates are observed in Greece, Italy, and the United Kingdom. As regards information searching, the lowest rates are in Iceland, Norway, Latvia**,** *Romania,* and Slovakia. However, the rates lie above 20 % in all those countries. *(Source:* OECD, PISA 2000 database)

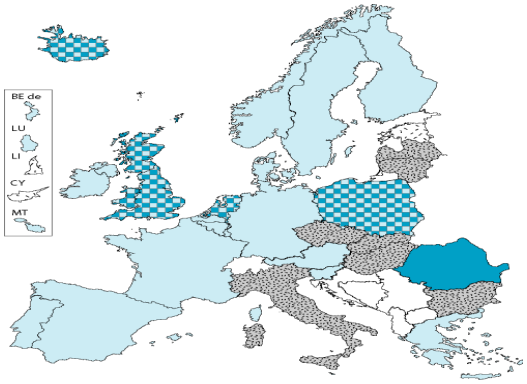
- *There is a variety of student profiles regarding technology use.*

This fact takes into account not only in relation to student's gender or socio-economic status but also to some of their individual characteristics such as self-confidence doing computer-based activities and performance in the PISA science test.

- *ICT familiarity matters for educational performance.*

Performance differences associated with the length of time students have been using a computer hold once accounting for socio-economic background. Compared to students who have only been using a computer for less than a year and once accounting for ESCS, on average in OECD countries there is a 30 score points advantage for students who have used computers for one to three years, a 51 score points advantage for students who have used computers for 3 to 5 years and a 61 score points advantage for students who have used computers for more than 5 years.

When ICT is included in the core curriculum, two main approaches may be distinguished. It may be taught as a separate subject in its own right, or used as a tool for other subjects and in some cases both. In addition to its use as a tool, ICT is a separate compulsory subject in a few countries, namely the Netherlands, the United Kingdom (with the exception of Northern Ireland), Iceland and Poland. In Romania, it is included in the curriculum solely as a subject in its own right.



Separate subject

Used as a tool for other subjects

Both

Not included in the compulsory minimum curriculum

Data not available

6. Conclusions

• Looking at the degree of urbanization, penetration by computers and Internet remains lower in thinly populated, rural areas of the EU.

• The presence of children in a household is a major factor in access to ICTs: the proportion of homes with a personal computer is 50% higher among households with children than for childless households.

• Despite increasing levels of ICT usage in all sections of society, the divide is not being bridged.

In this context, a few measures are necessary: to adopt holistic policy approaches to ICT in education; to adapt school learning environments as computer ratios reduce and the availability of digital learning resources grows; to promote an increase in computer use at school and experimental research on its effects.

A new understanding of digital divide is needed-one that provides adequate socio-cultural context and confers dedication to equity in education. So, eliminating the digital divide is one of current era's defining equity issues in schools.

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