

Digital Divide: Students' Use of the Internet and Emerging Forms of Social Inequalities

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Introduction

The emergence of the Information and Communication Technologies (ICT), their dramatic diffusion, and the growth of the Internet as an information conduit were accompanied by a general enthusiasm concerning their exploitation in education. According to the official rhetoric, in the modern knowledge and information societies, ICT constitute an extremely useful tool in education, which can improve students' academic performance and help young people in the transition to the labor market (Eamon 2004). It has been suggested that the exploitation of the Internet and interactive multimedia, in particular, can improve teaching, increase the sources of knowledge and promote students' engagement and motivation to learn (Pascarella and Terenzini 1998; Bransford et al. 1999; Chen 2008). They provide all students, regardless of socioeconomic background, with the opportunity to access a vast bulk of information, which can help them improve their academic achievement and can therefore contribute to the reduction of social inequalities in education (Heemskerck et al. 2005).

Such views are based on ideas concerning the future of industrial societies elaborated since the 1970s and the transition from the industrial to the knowledge and information society. In this society, the social and economic relationships are not organized on the basis of material goods but on the basis of the exploitation of knowledge and information. At the "heart of information society (as mediated by the Internet) is a radical decentring of communication," and in the information economy "we work primarily with our minds rather than with our hands" (May 2002, p. 10, 14). According to Van Dijk (2005, p. 133), the notion of the information society is "a *substantial* characterization of societies in which information increasingly is the primary means and product of all processes" (emphasis in the original).

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The concept of knowledge society was introduced by Drucker who argued that in modern societies the basic financial resources are not the capital, nor the natural resources, nor work, but knowledge. Developments after World War II and especially the emergence of new technologies have led to “the emergence of knowledge as the new capital and as the central resource of an economy” (Drucker 1992, p. xiii). Daniel Bell uses the term post-industrial society to refer to a new form of society, the post-industrial society, in which the basis is not “raw muscle power, or energy, but information” (Bell 1976, p. 127). The new society is now defined “by its novel methods of acquiring, processing and distributing information” (Kumar 1998, p. 97). As a result, young people should “be able to access, understand, and use the computer and Internet in order to develop the skills necessary to succeed individually and to contribute to future growth and prosperity of the information society” (Cleary et al. 2006, p. 354).

In this framework, Castells (1996) has proposed that ICT create a new kind of social structure, the network society. His core argument is that we are undergoing a shift from the industrial mode of development, in which the main source of productivity is the introduction of new sources of energy, to the informational mode of development in which “the source of productivity lies in the technology of knowledge generation, information processing, and symbol communication” (Castells 1996, p. 17). The network society consists of “networks of production, power and experience, which construct a culture of virtuality in the global flows that transcend time and space” (Castells 2000, p. 381). This is likely to accentuate social inequalities, since the networks have the ability to transcend place and time compared to other ways of organization, while not all workers are connected to networks or have positions with few connections (Castells 2000; Van Dijk 2005).

The information society idea has been severely debated. Frank Webster, for instance, reviews varying definitions of the concept of information society and concludes that “whether it is a technological, economic, occupational, spatial or cultural conception, we are left with highly problematical notions of what constitutes, and how to distinguish, an information society” (Webster 2006, p. 21). Similarly, it has been argued that there is not enough evidence to support the argument that we are moving towards a knowledge society (Sianou-Kyrgiou 2006).

The Digital Divide

The “optimist rhetoric” concerning technology-enhanced learning, which argues that ICT has the capacity to increase pupil achievement underpins the policies adopted by governments in many countries, their commitment to promoting ICT and the vast amounts of money allocated for the incorporation of new technologies in all stages of education (Reynolds et al. 2003). In Britain, for example, the government is equipping schools with multimedia blackboards (Hall and Higgins 2005), and is investing £45 billion in the “Building Schools for the Future” program (Facer and Sandford 2010, p. 74), with the hope of improving students’ academic performance. In Greece,

the effective pedagogical exploitation of ICT in education is considered a basic priority of the “New School” announced recently by the Ministry of Education, Lifelong Learning and Religious Affairs. Substantial investments target at equipping all schools with interactive whiteboards and broadband Internet access.

From the end of the 1990s, however, a critical issue of the rise of ICT appeared on the scene and became the focal point of the public, political, and scholarly debate, the issue of the so-called digital divide (Van Dijk 2005). The term was originally used in the mid-1990s to refer to “the divide between those with access to the Internet and those without” (Witte and Mannon 2010, p. 4) in relation to age, race, gender, and socioeconomic background (Mason and Hacker 2003; Van Dijk 2006). The concept of the digital divide comprises three distinct aspects: (a) the global divide, (b) the social divide, and (c) the democratic divide, which refers to “the differences between those who do, and do not, use the panoply of digital resources to engage, mobilize, and participate in public life” (Norris 2001, p. 4). According to OECD, the “digital divide among households appears to depend primarily on two variables, income and education. Other variables, such as household size and type, age, gender, racial and linguistic backgrounds and location also play an important role” (OECD 2001, p. 5).

In recent years, with the rapid spread of Internet technology and the fact that it constitutes an important part of the daily lives of many people, the interest has shifted towards the difference in use among individuals from different socioeconomic backgrounds (Bonfadelli 2002; Warschauer 2004; Van Dijk 2005; Peter and Valkenburg 2006; Livingstone and Helsper 2007; Hargittai 2008). It has been argued that beyond differences in access to ICT, differential uses are also likely to contribute to social inequality, since the effective exploitation of the Internet is related to a person’s socioeconomic status (Hargittai 2007; Hargittai and Walejko 2008, p. 240). ICT may exacerbate existing social inequalities, since computer and Internet skills are essential in education and the labor market (Attewell and Battle 1999; Rideout 2000; DiMaggio et al. 2001), in “the service and trade sectors and most jobs in the finance, technology, and manufacturing sectors” (Cleary et al. 2006, p. 355). A society characterized by differentiated skills in the use of ICT, and especially the Internet, may lead to different and unequal positions within it (Van Dijk 2005). It is now widely recognized that “the digital divide must be understood as incorporating a broad range of variables,” such as “language and literacy ability, computer skills, suitability of online content, and availability of instruction or social support that enable or constrain meaningful ICT use” (Warschauer 2010, p. 1552).

Inequalities of ICT Access and Use in Higher Education

The study of digital inequalities in education has expanded to include higher education (HE). It is widely recognized that digital technology has affected HE, and that within it there has been more technological change compared to other sectors of education (Selwyn 2010). HE institutions are now investing substantial resources to

provide students with Internet-based information and to equip classrooms and libraries with high-spec Internet connectivity (Selwyn 2008). Indeed, it has been suggested that “Information and communication technologies have become nearly as integral to teaching and learning as books. Rare is the course that does not utilize some form of IT, from using electronic resources in the library to conducting Internet research to delivering grades and other content through a course management system” (Smith and Caruso 2010, pp. 73–74). It is often thought that ICT can support learning in HE more effectively than traditional recourse-based learning methods (Breen et al. 2001). In addition, since “the worldwide web is now established as a key setting where students access and interact with information” it could be argued that ICT use is increasingly linked to their academic performance, their employment, and their social, political, cultural and political involvement in modern society and HE (Selwyn 2010, p. 35).

Research has also dealt with inequalities in ICT access and use within HE. In Smith and Caruso’s recent survey of college and university freshmen at over 100 institutions, it was found that “respondent ownership of computers has remained steady at around 98% for the last four years” (Smith and Caruso 2010, p. 9). They also found that students report spending 21.2 h/week on the Internet for school, work or recreation, while they report persistent gender differences in the use of certain technologies. Using data gathered by a web-based survey conducted on 232 college freshmen in the United States which was designed to determine whether a digital divide in Internet usage exists among college students, Cotten and Jelenewicz report differences in terms of race, and conclude that “Internet experience and gender affect particular types of Internet usage, suggesting that the digital divide is multilayered” (Cotten and Jelenewicz 2006, p. 497). Nevertheless, although “digital technologies are felt to support forms of university teaching and learning that are more efficient, engaging and equitable,” the notion of the digital divide in HE “is now notable only by its absence in contemporary education debate” (Selwyn 2010, p. 34).

Conceptual Frameworks

The above concerns lie at the heart of the scholarly debate about the digital divide and the interplay between Internet access and use and social inequalities. The issue is usually examined on the basis of the classic sociological perspectives, such as the functionalist, the conflict, and Bourdieu’s cultural perspective.

According to the functionalist perspective the digital divide can decrease when the disparities in Internet access decrease. When access differences become minimal, all people regardless of socioeconomic background will have equal opportunities to use the Internet as a source of information, learning, and communication (Compaine 2001). This is already happening to young people who have familiarized themselves with the Web (Negroponte 1995). Explanations which draw from the conflict

perspective point to the relationship between the digital divide and social inequalities and support the view that new forms of digital inequalities emerge. If the inequalities in Internet access decrease, then new divides will be created, so that people from the most privileged social classes will be at an advantage. As a result, the reduction of Internet inequalities is important, since Internet inequalities deprive a great number of people of access to knowledge, information and lead to social exclusion (Van Dijk and Hacker 2003; Peter and Valkenburg 2006).

Some researchers who examine the digital divide in education draw on Bourdieu's theory of the different forms of economic, social, and cultural capital (Bourdieu 1998; Bourdieu and Passeron 1977). Cultural capital exists mainly in the form of academic qualifications, while social capital refers to "the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition" (Bourdieu 1998, p. 51). Economic capital, that is, money wealth can be "cashed' in any part of society" (Grenfell and James 1998, p. 20). There is a relationship between the students' academic performance and the economic, cultural, and social capital of their family. These forms of capital are interconnected and can convert "from one type to another" (Bourdieu 1998, p. 54). For example, the economic capital can be used to buy computer and Internet access, educational goods and services so that it becomes cultural capital (Grenfell and James 1998).

The above conceptual approaches provide useful contributions to the understanding of the relationship between the Internet and inequality and also highlight the importance of examining ICT access and use from a sociological perspective. However, a constructive scholarly debate has not flourished in Greece. Most research studies focus on statistical analyses concerning Internet access, or the effective exploitation of ICT in the classroom. While useful, this body of literature concentrates on technical issues, and is usually technocratic and simplified (Gouga and Kamarianos 2007). It also focuses on primary or secondary school students, and fails to take into account the digital divisions in HE. There is, therefore, a gap of solid empirical data that could examine, for example, what HE students actually do when they are connected to the Internet and the relationship between Internet use and socioeconomic background. We also aim to contribute to the international debate by providing useful insights into the interplay between HE students' use of the Internet and their socioeconomic background. The research study we present here is distinctive in that it can provide policy makers with a useful tool in their effort to reduce disparities in Internet access and use among HE students. In addition, collecting both quantitative and qualitative data enables us to uncover the students' attitudes toward modern technology, at a time when household Internet access and especially broadband connection has increased significantly in recent years (Greek Information Society Observatory 2008, 2010). For example, broadband connections marked a considerable increase going from 56% in 2007 to 67% in 2008 and, by now, they constitute "the more popular connection type," although well below the EU27 average (Greek Information Society Observatory 2008, p. 6).

The Research Study

Research Questions

The theoretical considerations outlined above and the lack of empirical studies about the digital divide in HE from a sociological perspective in Greece, led us to pose the following research questions:

- (a) Is there a relationship between socioeconomic background and access to a computer and the Internet?
- (b) Is there a relationship between socioeconomic background and Internet use?

We hypothesize that students differ in terms of Internet access and use, and that socioeconomic background explains the greater part of this difference.

Data and Methodology

The sample included 100 first year students, 50 from the Medical School of the University of Ioannina and 50 from the Department of Early Childhood Care and Education from the Technological Educational Institute of Epirus. The sample included equal numbers of male and female participants. We decided to focus on these two departments for the following reasons. First, because according to official data they have different social class composition of students. More specifically, the Medical School is dominated by upper middle-class students, while the majority of students in the Department of Early Childhood Care and Education come from lower middle-class or working-class backgrounds. Second, these two departments admit students with different performance in the national university entrance examinations. In the academic year 2009–2010, the medical school in the University of Ioannina admitted students who achieved a general access mark of 19,105 points and above, out of a maximum possible number of 20,000 points. Students who were admitted in the Department of Early Childhood Care and Education achieved a general access mark of 13,847 points and above, a difference of 5,258 points.

Both qualitative and quantitative methods of data collection were employed, since “they involve differing strengths and weaknesses” and “constitute alternative, but not mutually exclusive, strategies for research” (Patton 2002, p. 14). A self-completed questionnaire was administered to first-year students in the spring semester of the academic year 2009–2010. It consisted of a number of predetermined response categories with close and open questions with the aim of investigating students’ experiences and attitudes towards the Internet and the impact of their socioeconomic background. We also conducted ten semi-structured interviews. Semi-structured interviews were utilized because they “result in a true and accurate picture of the respondents’ selves and lives” (Fontana and Frey 2005, pp. 698–699) and provide

in-depth, detailed data collection, and allow researchers “to enter into the other person’s perspective” (Patton 2002, p. 341).

In our study we used the OPCS (1991) scale to assign socioeconomic status based “on occupation in the Standard Occupational classification system developed by the Office of Population Censuses and Surveys” (Power et al. 2003, p. 161). We employed this scale because it is widely employed in many empirical studies. We also accept that for people under the age of 25 their position is defined in relation to their parents’ occupation. To assign social class we used parental socioeconomic status. We have employed a pattern of six social and occupational categories that involves the hierarchical classification of occupations on the basis of education and professions (Crompton 1998).

As far as the social composition of the students in the sample is concerned, the Department of Early Childhood Care is dominated by lower middle-class or working-class students, while the majority of the students in the Medical School come from upper middle-class or middle-class backgrounds. More specifically, 4% of the students from the Department of Early Childhood Care come from the upper middle-classes, 26% are middle-class students, while 70% are working-class students. By contrast, 10% of the students from the Medical School come from the upper middle-classes, 54% are middle-class students, while 36% are working-class students.

Findings

Computer and Internet Access

All but 2% of the sample reported having access to a personal computer at home. This is not surprising, given the fact that in recent years prices have fallen, so that even students from poorer families can afford a personal computer. However, different findings emerge if we examine the relationship between Internet access at home and students’ socioeconomic background. Research data show that all upper middle-class students have Internet access. By contrast, 70% of middle-class students have Internet access at home, while for working-class students the percentage is only 53%. According to official data for 2010, 46.4% of Greek households have an Internet access at home, while 53.4% of households have a computer, of any type, at home (Hellenic Statistical Authority 2010). As far as the diffusion of new technologies is concerned, in the last 5 years Internet access at home increased by 100%, computer access has increased by approximately 45%, and broadband connections have increased by approximately 435% (Hellenic Statistical Authority 2010).

When asked whether their parents are familiar with Internet use, 71.5% of upper middle-class respondents reported that their parents can use the Internet, while the percentages for middle-class students and working-class students are 55% and 21%, respectively.

Internet Use

Research findings provide evidence of a relationship between the students' socio-economic background and Internet use. Upper middle-class students reported a wider range of Internet uses compared to students from the lower middle-class and working-class students. More specifically, the former reported the following Internet uses: downloading software, online submission of forms, communication via e-mail, Internet telephony, voice calls, video calls via the Internet, reading online newspapers, reading online books, blogs, discussion forums, accessing websites which will help them for their university assignments, seeking information about goods or services, using RSS service, buying goods from online stores, creation of a personal website, listening to Internet radio stations, etc. By contrast, lower middle-class and working-class students have a more restricted Internet use. They use it primarily for communication through e-mail, discussion forums, playing online video games, downloading music, and blogs. They also use it to read the news and to find information, but they do it far less frequently. Few students reported that they use it for online buys or in order to find information relevant to their studies.

Apart from the variety of Internet uses, interesting findings emerged in relation to the use of the Internet for educational purposes. All but one upper middle-class students reported using the Internet frequently in order to find information from scientific journals, scientific articles and for buying books from online stores. They also reported that they use it to find information about their studies and university assignments, and that they visit the official website of their university department or the website of the university library almost every day. The percentage is 47.5% for middle-class students and 40% for lower middle-class and working-class students. A significant finding was that working-class students often respond that they do not distinguish between reliable and not reliable websites in relation to information finding, while very few mentioned the reliability of the Internet-based sources they use. As a working-class student from the Department of Early Childhood Care and Education said: "I use search engines to find information for my assignments ... I simply type the word I am looking for." By contrast, students from more privileged social classes often report that they look for information: "from international medical websites ... information from Medical Schools abroad" (female Medical School student with a mother with postgraduate studies). These students seem to be more able to distinguish between reliable and not reliable websites. It is also interesting to note that, at least as far as educational uses of the Internet are concerned, students from higher socioeconomic backgrounds seem to have more Internet literacy skills, being "computer virtuosi," while students with families with a lower educational background are simply "ordinary computer users" (Attewell 2001, p. 257).

This differentiation is significant, as an important aspect of the digital divide concerns the differentiation of Internet users in relation to the ability to assess and evaluate the reliability of the information contained in it (DiMaggio et al. 2001). Such disparities in Internet skills are important because they have consequences for the academic performance of students. Given the fact that Internet skills are

indispensable for university assignments, searching for bibliography, students who are not able to have access to reliable sources of information will be at a disadvantage compared to students who have access to reliable information sources.

Research data also revealed that use of the Internet as an information medium is patterned according to students' socioeconomic background. For example, most upper middle-class students reported that they use the Internet frequently to read the news from online newspapers/magazines. As a Medical School upper middle-class female student said: "I rarely watch the news on TV, I trust the Internet most." The percentage was 35% for middle-class students and 21% for working-class students. Similar results have been found in other studies. Peter and Valkenburg (2006, p. 300) examined Dutch adolescents' Internet use and found that "adolescents' use of the Internet as an information medium was influenced by their socioeconomic and cognitive resources."

As far as using the Internet as a means of communication is concerned, differences were also found. While most students in the sample use the Internet for communication, regardless of socioeconomic background, the majority of working-class students prefer more "traditional" uses, such as the e-mail, while students from the upper social classes more often use more sophisticated ways of communication through the Internet, such as video conferencing.

Finally, as regards the use of the Internet as a source of entertainment, little differences were found among students from different socioeconomic backgrounds. More specifically, about 85% of the students in the sample reported that they often use the Internet for entertainment purposes, regardless of socioeconomic background. The following response of a working-class student is a recurring pattern of attitudes toward the Internet "You can have a good time, listen to music, play games, it's just so good."

Discussion and Conclusion

The first research question we posed concerned HE students' socioeconomic background and access to a computer and the Internet from home. The research findings suggest that disparities in access to computer technology are almost nonexistent and that the penetration rate of computer technology is very high. The narrowing of the divide in access to a computer can be attributed to the fact that prices have fallen significantly in recent years. Another factor is that most families buy computers for their children because computers are considered as a means that will increase their children's academic performance and provide them with more educational opportunities and useful, lifelong skills. Research data also show that there is still a divide in relation to Internet access at home among students from socioeconomic background, especially for working-class students.

An important finding was that HE students from more privileged socioeconomic backgrounds make more frequent use of the Internet for educational and academic purposes. It could be argued that they are more likely to gain more educational

benefits from it, for the following reasons. First, effective use of the Internet as a medium for accessing information is indispensable for successfully completing university assignments. Second, divisions in Internet use for accessing information are important for the students' transition to the labor market, since "employers increase the emphasis they place on the ability to acquire, manipulate and apply information, and reduce the emphasis on memorizing facts" (Breen et al. 2001, p. 96).

Findings also provide preliminary evidence that students from families with higher socioeconomic background are more critical users of the Internet and have more skills than their counterparts from families from lower socioeconomic background, or with no history of participation in HE. Similar results were found in other studies which document "the appearance of a usage divide between parts of the population systematically using and benefiting from advanced digital technology and the more difficult applications and services, and other parts only using basic digital technologies for simple applications with a relatively large part of entertainment" (Van Dijk and Hacker 2000).

Even if the small sample means that care should be taken in generalizing the research findings, the empirical data presented provide evidence that universal access to computers and the Internet does not necessarily lead to a reduction in the digital divide. We argue that the digital divide widens, despite the fact that the problem of physical access to a computer no longer exists. The digital divide is now a divide in use rather than access (Bucy 2000; Warschauer 2003; Peter and Valkenburg 2006). Our research findings are in line with other studies which conclude that "Internet access alone obviously does not automatically guarantee an informed and knowledgeable public" (Bonfadelli 2002, p. 81) and that "obtaining a PC does not confer, at a stroke, the skills and experience enjoyed by those who have a longer standing acquaintance with such technology" (Hull 2003, p. 132). The increasing diffusion of the Internet among the population means that in the examination of inequalities in relation to the Internet it becomes less useful to simply focus on binary classifications of who is online, but rather we need to start examining differences in how those who have access make use of the medium, that is, differences in people's online skills (Hargittai 2002).

In relation to the opposing arguments about the "social consequences of Internet use," we found initial support for the view that socioeconomic background remains a key parameter of differential Internet use, since research findings do not seem to support the argument that widened access to the Internet is "enabling and egalitarian, promoting social inclusion" (Willis and Tranter 2006, p. 43). We therefore propose a new interpretation of the concept of digital divide in contemporary HE. We need to take into account the emerging digital inequality which refers not only to differences in access, or binary distinctions between "information-rich and the information-poor" (Angus et al. 2004, p. 3), but also to "the purposes for which the technology is employed" (DiMaggio and Hargittai 2001, p. 1). In other words, the divide acquires qualitative characteristics and is related to social class (Iske et al. 2005). We argue that any attempts to examine social inequalities in HE need to examine the issue of the digital divide in relation to Internet use, as it constitutes a critical parameter which has an effect on academic knowledge, students' academic performance, and their transition to the labor market.

Implications for further research are clear. Since our study provided evidence that inequalities in modern technology use in HE are not diminishing, there is a clear need for the debate to address the issue of digital divide within HE in more sophisticated terms. Researchers should focus on the digital divide in relation to such factors as household residence, and examine who uses the Internet, for which purpose and in what ways, as well as the ways through which social inequalities are exacerbated (Chen and Wellman 2005). The investigation of the characteristics of digital divisions which manifest themselves among HE students, such as inequalities stemming from effective use of ICT to access information, gender, race, and/or technological experience, also merit a sustained program of future research (Selwyn 2008, 2010). In addition, this study has not examined all four dimensions which make up digital inequality: access, digital literacy, intensity of use, and purpose of use (Castaño-Muñoz 2010, p. 45); nor has it dealt with parameters such as “age, gender, race, ethnicity” which are “relevant to one’s ICT experiences” (Hargittai 2008, p. 939). Future research should thus focus on these parameters.

Finally, in relation to policy implications, we believe that disparities in Internet use among HE students merit policy attention. Second, public policy needs to target both Internet access and use, since factors such as educational background, income, occupation, age, gender, and race impact strongly on the instrumental uses of the Internet. There is an urgent need for policy efforts to focus on helping students from disadvantaged socioeconomic backgrounds to acquire not only physical access to the Internet, but also information-age skills necessary for its effective exploitation. Of course, as it is widely accepted, no intervention will be effective unless measures are introduced which aim at reducing existing social inequalities.

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