Literacy issues in the era of the new media

José Afonso Furtado
Art Library
Director
Calouste Gulbenkian Foundation
Portugal

Introduction

> *Someone once wittily remarked that the world is divided into those who divide people into two types, and those who don't.*
>
> Daniel Chandler

For more than 500 years since the 15th century, Western culture was dominated by the printing and its practices. The book, which concept slowly overlapped with that of the "typographical book", progressively gained a sound authority. At the same time reflecting and affecting the way we reason and our knowledge frameworks, the book consolidated its primordial function as a symbolic object. Our contemporary educational system was shaped during this period, upon an elementary curriculum essentially focused on skills for reading, writing and abstract techniques for handling numbers (Lacy, 1983, pp. 117-127).

However, as noted by Henri-Jean Martin, the creative power of the book and its penetration strength appear somewhat weakened in the 20th century: «The book has loose its earlier power, not any longer the master of our reasoning or our feelings...(…) Now are the new information and communication media, emerging from a "sea of paper" produced by the multiplication of writing" (Martin, 1988, pp.422-425). Thus, we have witnessed the decline of the dimension of the book as aura, the slow evanescence of its culture, bringing about a particular moment in the history of knowledge transmission and creation processes.

This is the context, made evident in the last few years, of the exponential increase in the production of digital born information and documentation, as well as the ever growing digitization of content from the analogue and printed culture. Data from research carried out in 2003 shows that about 90% of the *new* information produced and distributed each year, and later recorded and maintained, is stored in magnetic media, most often hard disks. It is true, however, that the amount of original information conveyed in print did not diminish between 1999 and 2002; yet this is explained by the steady increase in office documents, in particular by photocopying and desktop printing. Because of the growing affordability and diversity of memory devices, the market share of hard disk technologies presents the highest increase among all types of media, at a rate of 115% for the same period. On the other hand, the amount of new information generated in flows is over three times the volume of archived information. Despite the Internet being the most recent medium for information flows, the rapid pace of its dissemination has no precedent in the history of media. Therefore, even considering that a significant part of the information produced is uninteresting and irrelevant, the trends mentioned above suggest that, in the long term, the most needed content and documents will be produced, distributed and stored in digital format (Lyman & Varian, 2003; Varian, 2005).

Compared to print, digital documents demand hardware and software support without which it is not possible to access information. The technological mediation is

something completely foreign to the printed world: printed books never required any additional mechanism to be used, to be immediately readable. In turn, computer-mediated reading depends upon technical devices that transform data encoded in the physical memory of a machine into human-readable information on a screen, and a power source for the equipment as well (Debray, 2000; Lynch, 2001; Souchier, 2003).

This completely new reality, which greatly changes the way we deal with all sorts of documents, combined with the rapid pace of the Internet penetration in all aspects of our daily life (especially since the appearance of graphic Web browsers, in 1993) have motivated many reflections on the demographic patterns of its diffusion.
Both social researchers and other scientists, and political decision-makers have paid especial attention to the segments of the population that have access to and use the Internet, nowadays considered an important resource for equal opportunities, for economic mobility and for social participation (Hargittai, 2003; DiMaggio *et al.*, 2003).

Several studies have demonstrated that certain social groups have problems to use new ICT technologies, hence to access information services and content. A direct consequence of this a «discrimination betweenthose who can be denizens of the Infosphere and those who cannot, between insiders and outsiders, between information rich and information poor» (Greco & Floridi, 2004, p.75). This situation, which inevitably contributes to new social inequalities, has been commonly designated by digital divide.

The digital divide

Since the second half of the 90s that issues regarding inequality in access to and use of new media have been framed by the concept of digital divide, a term that became established rapidly and is extensively used. Yet, its meaning is loose and some definitions can be even misleading. In fact, the origin of the term is uncertain, though many consider that it first appeared, in a consistent way, in the report *Falling Through the Net: Defining the Digital Divide*, the third of a series published by the US Department of Commerce's National Telecommunications and Information Administration (NTIA) in 1999. The Introduction of the Report presents people divided into two simple groups: the report defines digital divide as «the divide between those with access to new technologies and those without» (NTIA, 1999, p.xiii). For many researchers, however, what happened was an appropriation and redefinition of a term already in circulation in the environment of mass media and the NTIA political agenda in the process of preparing the Report (Carvin, 2001; Gunkel, 2001).

Actually, the designation had been in use since at least 1996, though with varied meanings which generally reflect differences in opinion between the most sceptical of technological solutions and those believing that scientific advances will drastically improve life standards. The meaning that would prevail is focused on the unequal distribution of information technologies in US public schools. For example, in a speech in 29 May 1996, Al Gore referred to the «digital divide» to designate the gap between the *information haves* and *have-nots* in the K-12 degree of the US educational system. Later on, as the term was frequently used by the Clinton–Gore Administration to justify

several educational initiatives and policy measures, this particular meaning and understanding was popularized by the mass media. The «digital divide» becomes the new designation for issues that used to be expressed by *information haves* and *havenots*, the question of access versus universal service (Gunkel, 2003).

Even in this original usage, the term still conveys some ambiguity. For Benjamin Compaine, the meaning of «digital divide» in the NTIA reports was not always the same: «In the original iteration of the NTIA surveys it meant primarily personal computer ownership. More recently it has come to incorporate internet access.» (Compaine, 2001, p. xiii).

In a first moment, the problem was apparently confined to access to equipments and network connections. Indeed, several reports described extreme disparities in access to computers and the Internet. The *Human Development Report 2001*, by the United Nations Development Programme (UNDP), provided evidence of a critical situation in the diffusion of the Internet: it was used just by circa 6,7% of the world population. This was aggravated by the fact that 54,3% of them were from the US and 28,2% from the rest of OECD countries, contrasting with 3,2% from Latin America and Caribe or 0.4% from the Sub-Saharian Africa. Furthermore, while the Report indicated a trend in the reduction of inequalities, it was very slow: OECD countries, corresponding to just 14% of the world population, represented 88% of the Internet users, in 1998, and 79% in 2000. Nevertheless, the digital divide is not reducible to disparities between industrialized and developing countries, it is also a problem internal to the so-called advanced societies. In fact, the use of the Internet is clearly concentrated and in the long run, the digital divide is reshaping «the map of worlwide society, generating or widening generational, geographic, socio-economic and cultural divides.» (Greco & Floridi, 2004, p.75).

This situation has motivated a series of interventions by many institutions at the national and international level, and the United Nations, UNESCO, the European Union (EU) and the G8 have been working on solutions for this problem. For example, taking the reduction of the digital divide between developed and developing countries a key objective for the European Union, the European Commission established the *eEurope* plan, following the Lisbon Summit of March 2000. By extending the Internet to all areas of the European society, the goal was to provide European citizens with online access for all aspects of their lives, so that they can participate and take advantage of the possibilities offered by digital technologies. One first strategy was to augment the availability of new technologies by making them more accessible; and, overall, the various policy documents give particular attention to the economic aspects and to productivity and competitivity factors associated to them. However, some conceptions are emerging that reach beyond the perspective of inequalities based on access to computers or the Internet. For example, the *Digital Divide Network* by the Benton Foundation, considers the digital divide as the gap between those who can and those who cannot make an effective use of the new information and communication tools such as the Internet; the OECD *Information Technology Outlook 2004*, points to the crucial aspects: «differences are increasingly linked to unequal use», and the digital divide «is progressively shifting from a simple and slowly reducing “access” divide to a more complex “use” divide. The Internet amplifies social differences as new uses emerge. This suggests that attention should increasingly be paid to “how to use” issues.» (OECD, 2004).

For all the above, the term «digital divide» is getting connotations for different types of technological and social disparities which, in the words of Conmpaine, are turning the problem into a real «moving target». This is highlighted in the proposals by some researchers of a more elaborated understanding of the notion suggesting, for example, different levels of the digital divide manifestation. Rob Kling (1998) distinguished between technological access, referring to the physical availability of the appropriate equipment, (encompassing computers and software adequate for a given activity); and social access, which regards the **«**know-how, a mix of professional knowledge economic resources, and technical skills, to use technologies in ways that enhance professional practices and social life.» In turn, Pippa Norris (2001) points to three levels in the «divide»: the global divide, respecting to differences between developed and less developed countries; the social divide, meaning inequalities among the population within the same country; and the democratic divide, referring to differences between those who can and those who cannot make use of the new technologies to participate in public life.

Whatever the definition, more or less comprehensive, the digital divide presupposes always a duality between two antagonistic types: those who have access to equipment and network connection, and those who have not; those who know how to use the new technologies and those who do not; those who possess enough bandwidth, and those who do not, etc. This duality places the digital divide in the family of the «great divide» theories analyzed by Daniel Chandler (1994). For Chandler, who paid special attention to the conceptions of a divide between the oral and literate culture as theorized in the 60s by authors such as Walter Ong, Eric Havelock or Jack Goody, «such theories tend to suggest radical, deep and basic differences between modes of thinking in non-literate and literate societies», and are usually associated to grand theories of social organization and development. However, they imply a rigid and sometimes simplistic representation of a reality that is more close to the complexity of a *continuum* (Gunkel, 2001). The binary approach «literate/non-literate» has been considered as a false dichotomy (Warschauer, 2002; Cope & Kalantzis, 2000; Gee, 1996; de Castell & Luke, 1986; Street, 1984). Or, as explained by Harvey Graff, «none of these polar opposites usefully describe actual circumstances; all of them, in fact, preclude contextual understanding.» (Graff, 1987, p. 24).

Criticisms of this kind have been levelled at the notion of digital divide and its dichotomies, often used to describe socio-technological differences. As underlined by Gunkel (2003), «the binary form necessarily risks oversimplifying the situation and neglecting the important variations that exist in the object of study.». Jan van Dijk, too, considers the digital divide metaphor - which became popular in the last years of the 20th century in the US and diffused in other countries and languages through similar expressions – as a simplification of the phenomenon of inequality of access to digital technologies. Notwithstanding, the term appears to have succeeded as it introduced the question into the social, political and academic agendas. In a way, the dichotomist vision of the digital divide as a distinction between people having and not having Internet access was natural in the first stage of its diffusion. Especially in the US, this was even consistent with the political paradigm of the Federal Government from the time of the Eisenhower Administration, based on the experience of the telephone as a public service, a paradigm focused uniquely on the domestic access (defined in binary terms) and paying special attention to the disparities between urban and rural areas (DiMaggio & Hargittai, 2001). Apparently, such a simplification was needed to raise

enough attention to such a complex problem (van Dijk, 2003). This goal may have been achieved, yet at the cost of multiple misunderstandings.

To start with, the metaphor itself suggests a simplistic division between two groups clearly separated by a large gap, thus implying the presupposition of chasm in a bipolar society. What we can observe in our contemporary societies is not, however, a binary division between information *haves* and *have-nots*, but rather a gradation of different levels of access to information technologies, a social, economic and cultural differentiation increasing in complexity (van Dijk, 1999, 2005b; Warschauer, 2002, 2003b, 2003c).

A second misunderstanding follows from this, consisting in the belief that the divide occurs between absolute inequalities, between those integrated and those excluded. But, as pointed out by van Dijk (2005b, p.4) «the image of an extended spectrum of positions stretching across populations might be more appropriate.» If a demarcation exists, a threefold distinction would be more adequate, recognizing that most of the population having some access and doing some use of new technologies remains in between an information elite and the digital illiterate, or the actual excluded. This may signify that some people do get access to new technologies earlier or at a faster rate than other; or that there are some individuals with more equipment, software and skills than other; or even that a given group uses technologies more often or in a different way. Thus, it is clear that one should not run into the opposite error of underestimating these relative inequalities, particularly in the context of the information or network society that is ours (van Dijk, 2003, 2005b; Hargittai, 2002; Warschauer, 2002, 2003c).

Another distorted vision is the one considering a single divide, when the problem is rather more complex. According to the framework proposed by van Dijk, there are several divides running in parallel in four successive types of access: motivational, physical or material, skills and usage (van Dijk, 2005b). This connects to another misleading connotation, the idea that the divide is a static condition. In fact, all types of access are in a permanent evolution and while for some the divide may reduce, for other it can augment (van Dijk & Hacker, 2003).

On the other hand, the presence of the term *digital* may suggest that the divide is a technical question. As a matter of fact, many analyses and discussions of the digital divide, as they come from governmental and academic institutions, or even as they are presented by the generalist media, are based on or develop arguments from positions usually considered as technologically deterministic (Gunkel, 2003; Warschauer, 2002, 2003c). It happens that technological determinism is a persuasive conception, by which socioeconomic problems are reduced to technological issues in such a way that investment in technology appears closely linked to economic and social development. Gunkel notes that many reports, texts and discussions on the digital divide, «do not question this prevailing technological determinism, but exploit it», as they take for granted «radical and persistent differences between distinct socioeconomic forms and defines these difference technologically.» Thus, the digital divide discourse conveys distinctions between analogue and digital technology, «the "new digital economy" of e-commerce and the "old economy" of industrialized production, the Information Age and the Industrial Age, and the opportunities enjoyed by those individuals who are able to participate in the "digital revolution" and the unfortunate experiences of those who

cannot.» (Gunkel, 2003). It is wise, therefore, to take into consideration how the theory of determinism has contributed to the modelling and formulation of the digital divide problem. In fact, framing the digital divide as a technological issue suggests that access to technology can, on its own, solve social problems, including the problems of social inequalities, of democracy, of freedom, etc. Well, providing a person with a computer and an Internet connection does not solve any of these problems.

To sum up, as Rob Kling wrote in a personal communication to Mark Warschauer, the major problem with the perspective of the digital divide is founded in the fact that it tends «to connote "digital solutions", i.e., computers and telecommunications, without engaging the important set of complementary resources and complex interventions to support social inclusion, of which informational technology applications may be enabling elements, but are certainly insufficient when simply added to the status quo mix of resources and relationships.» (quoted in Warschauer, 2003c, p.7-8).

This kind of critical reserve led researchers in the field to take one of two diverse positions. One of them, despite recognizing the historical importance and usefulness of the digital divide concept in highlighting a decisive social problem, and even the good service done by the NTIA reports in providing statistical data and trends, prefers to use alternative terminology and concepts which appear to describe more rigorously the issues at stake and the challenges to be faced. In this context, Warschauer proposes a framework designated *technology for social inclusion*, which he describes as the «intersection of ICT and social inclusion.» The justification is simple: first of all, ITCs «do not exist as an external variable to be injected from the outside to bring about certain results. Rather, it is woven in a complex manner in social systems and processes»; secondly, Warschauer considers that «from a policy standpoint, the goal of using ICT with marginalized groups is not to overcome a digital divide, but rather to further a process of social inclusion. To accomplish this, it is necessary to "focus on the transformation, not the technology.» The term is here understood as in Stewart (2000), i.e., not only as an adequate share of resources, but also as "participation in the determination of both individual and collective life chances (Warschauer, 2002; 2003c, p.8). The same is argued by Paul DiMaggio, Eszter Hargittai ou Kenan Patrick Jarboe. For them, while a public policy should exist towards a society with an equitable distribution of new information technologies, the research agenda and the methods appropriate to analyse the distributive questions can no longer be the same of the first stage of Internet diffusion, and the concept of *haves* and *have-nots* of technology has lost usefulness. It is precisely the growing penetration of the Internet that demands a new paradigm reaching beyond the binary perspective of access, towards a more refined conception of inequalities in technological opportunities. Therefore, they propose the replacement of «digital divide» by the concept of *digital inequality*, encompassing not only «the differences in access but also to inequality *among* persons with formal access to the Internet.» (DiMaggio e Hargittai, 2001; see also Hargittai, 2002); and that one should move from the concept of «divide» to that of «inclusion» as a core principle for organizing analysis and actions, meaning that the debate should no longer be focused on the issue of Internet access but rather on the inclusion in the information economy. This perspective, less connected to just the use of information technologies, embraces a more comprehensive description of the technological, economic and social aspects of the ICT revolution and the development of a new economy (Jarboe, 2001).

Another position considers that the concept of digital divide should be retained for strategic reasons, though recognizing that its causes and effects are not sufficiently articulated and clarified, and that the concept has is prone to several misunderstandings, notably in its limited perspective of the problem as being about technology or physical access. Actually, as the concept attained a widespread acceptation and integrates the political agenda, it «should not be moved from the table and smashed to pieces by scientific hairsplitting and political opportunism. It is a longterm problem that will mark all future information societies.» (van Dijk, 2005b, p.3). Thus, the question is not about finding the «adequate» theory and providing for its consistent application, but about making a dynamic use of the theory in order to open the «digital divide» to a critical reflection not aimed at questioning the validity or importance of the social and technological issues associated to the term, or finding a precise and restrictive definition, but rather focused on understanding its polysemy. It is thus indispensable to reconsider and reframe the digital divide concept (van Dijk, 2005b, Gunkel, 2003; de Haan, 2004).

Re-conceptualizing the digital divide

The re-conceptualization of the digital divide has captured particular attention from researchers at the University of Twente (van Dijk 1999, 2004 and 2005b; van Dijk & Hacker, 2003) and the Dutch Sociaal-Cultureel Planbureau (SCP) (Van Dijk *et al*., 2000; De Haan & Rijken, 2002; De Haan & Huysmans, 2002a, 2002b; De Haan, 2004). The latest descriptions of the main argument behind the theoretical model generated by such investigations underline the relationships between four points, in a process that leads to the emergence of information and communication inequalities, more or less accentuated, in the usage of digital technologies:

1) A given number of inequalities in terms of *personal* and *positional* categories. Personal categories are those based on physical or mental properties of individuals, such as age, gender, race, intelligence and personality, while positional categories (designated by de Haan (2004) as «context opportunities») are related to given positions in the division of labour, education, home, and within and between nations. For van Dijk (2005b), inequalities based on these categories are purely social.

2) The distribution of resources relevant to these kinds of inequalities. In this theoretical framework there are at least three mechanisms (social exclusion, exploration and control) that link categorial inequalities to a specific resource distribution, resulting in different types of unequal access. For Van Dijk (2005b, p.19) this emphasis on resources and distribution mechanisms conveys the concept or theoretical approach «that stresses the *means* and the barriers or constraints to reaching *particular* goals, such as equal opportunities in particular fields.» In this context, the most relevant resources are temporal resources (time spent in different life activities), material resources (level of income and all sort of goods excluding computers and services), mental resources (knowledge, general social and technical skills, excluding digital

skills), social resources (position and relationships in social networks) and cultural resources (acquired cultural factors such as *status* e all sorts of credentials).

3) The type of access to information and communication technologies. This theoretical perspective breaks down the concept of access into four specific and successive types of access to technologies, computers and Internet connection: motivational access (motivation to use digital technologies); physical and material access (possession of computers, network connection or permission to use them and their content); access skills (possesion of operational, informational and strategic digital skills); and, lastly, usage access (number and variety of applications, usage time). These four types of access are *successive* (in the adoption of a new medium the priority goes from first to last of access types indicated, during the whole process of diffusion of innovation); they are also cumulative (the first is a condition of the second, and so on); and they are *recursive* (each new innovation restarts the process at an earlier phase, not necessarily the first). Actually, access to media and technologies should be seen as a *process* with a variety of social, mental and technological causes and not just as the event of obtaining a particular technology [1] (Bucy & Newhagen, 2004; van Dijk, 2005b, 2004, 2005a).

4) The areas of participation in society. The consequences of having more or less access to new media are social inclusion in or exclusion from the various areas of society, such as labour market, education, culture, politics, social relationships and the variety of institutions. The consequences are an integral part of the general concept of participation in society (van Dijk, 2005a, 2005b; de Haan, 2004).

This central argument can be summarized in the following propositions, formulated as the core of a potential theory of the digital divide (van Dijk, 2005b) or of a multifaceted model for the analysis of social inequalities in the information society (de Haan, 2004): a) categorial inequalities in the society produce unequal distribution of resources; b) unequal distribution of resources leads to unequal access to digital technologies; c) unequal access to digital technologies also depends on the characteristics of technologies; d) unequal access to digital technologies causes unequal participation in society; e) lastly, unequal participation in society aggravates categorical inequalities and the unequal distribution of resources (van Dijk, 2005b; de Haan, 2004; Mason & Hacker, 2001).

The advantages of this theoretical model for a better understanding of the digital divide seem evident. On the one hand, the clear distinction between categorial inequalities, their effects on the distribution of resources and direct connection to inequalities of access to ICT, provide a theoretical framework much more elaborated than that used in the majority of generalist surveys about the digital divide; on the other hand, refining the concept of access brings clarification to some persistent misunderstandings; finally, a deeper reflection on the potential consequences of the unequal access to ICT makes it possible to explicitly disclose what is at stake in the

[1] See de Haan, (2004); Van Dijk (1999); Van Dijk & Hacker (2002) and Steyaert (2002), about the advantages of the *hierarchical* model of access versus the circular and transversal model defended by, e.g., Viherä (2000) and Marsh (2001).

digital divide – the participation in or exclusion from society, now and in the future, in a variety of areas. This calls for the anticipation of a set of urgent policy measures to minimize the divide effects, as opposed to theories of the type *wait and see* according to which the simple market game will tend to overcome the digital divide (Compaine, 2001; Thierer, 2000; Crandall, (2001).

The crucial issue of access

The first hindrance to all the research and discussion about information inequalities comes upon the multifaceted concept of access, used at great ease and in many different senses. It is undisputable, however, that the most popular meaning in the context of digital technologies is that relating access to ownership (or availability) and usage of a computer and an Internet connection. In part, this situation is understandable, as studies on the digital divide got their initial impulse from observations of the number and category of people owning a device and a network connection, thus considered as beneficiary of a particular technological opportunity. On the one hand, what happed was the generalization of the idea that the problem of information inequalities in the context of new technologies would be solved when everybody could have access to a computer and the Internet; and, on the other hand, the technological orientation of the initial research studies on the digital divide also contributed to the same idea of equating access to media or technology with physical access (van Dijk, 2005a e 2005b; van Dijk & Hacker, 2003; Bucy & Newhagen, 2004; Warschauer, 2003c; de Haan, 2004).

In fact, we can observe that the complexity of access issues has been frequently ignored, while it is obvious that the matter cannot be reduced to problems of technological infrastructure, multiplication of equipments or bandwidth. Yet, as noted by Thomas Callister Jr and Nicholas Burbules, most discussions about the digital divide rely on the instrumental metaphor of the computer as a tool. The problem is conceived as «some having access to the tool, or learning how to use the tool, while others do not. The "solutions" to this problem, therefore, are always conceived in terms of getting this tool into more hands, so that they can learn to use it too.». But, while it is true that for certain objectives «a computer *is* a tool and there are some things you simply can't do without it», such a position reveals a technocratic conception which is limitative of our capacity for understanding the complex problems and relationships that are at stake when one *accesses* modern information and communication technologies (Callister and Burbules, 2001).

Such an instrumental vision *externalizes* technologies, taking them as fixed objects for certain usages and objectives, resulting in a rhetoric of the «technocratic dream» in its various versions. First among these is the notion of a computer as «panacea», i.e., the idea that new technologies carry inherent possibilities, susceptible of solving the problems and revolutionizing the sectors in which they are applied. Another view in this perspective is the second variant of the technocratic dream, that of the computer as a «tool». For its defenders, the vision of technology as «panacea» is wrong because it places too much expectation on new technologies as mere tools which, used for good or bad aims, cannot guarantee, on their own, success or failure, damage or benefit, as all depends on the way they are used. This position, also known as the «neutralist» theory of technology (Feenberg, 1991), runs into the inverse error of the

first: where the perspective of «panacea» places too much faith in technology itself, the perspective of «tool» confers too much credit to people's capabilities to use technologies wisely and with moderation. Furthermore, it ignores possible unintended consequences or the fact that technologies have limits inherent to the modes and aims of their usage. Lastly, a more elaborated position is that of the computer as «non-neutral tool», the best known formulation of which is conveyed in the so-called "First law" of Melvin Kranzberg. It states that «technology is neither good nor bad; *nor is it neutral*» (Kranzberg, 1985, p.50) and recognizes that all technologies carry with them certain tendencies regarding their usages and do contribute to model the conception of purposes for which they can be adequate (Feenberg, 1991; Warschauer, 2000, 2003c). However, despite being more sophisticated and sensible, establishing a trade-off between costs and benefits, integrating unintended consequences and recognizing the imperfect nature of human rationality, this position is still a variant of the «technocratic dream», for several reasons. Firstly, it assumes the conceptual framework of the direct relationship between means and ends, while thinking beyond technocracy means understanding such a relationship as the artifact of a particular cultural and historical formation; secondly, it maintains the cost/benefit calculation as the way to evaluate change; lastly, the identification of means and ends, and the cost/benefit calculation builds upon the idea that it is possible to distinguish between «good» and «bad» aspects, aims and consequences; however, «the *very same* effects can be regarded as "good" or "bad", depending on other considerations, or when evaluated different people, or when judged within alternative time frames.» (Burbules & Callister, 2000, p. 7-12).

Alternatively, Burbules e Callister (2000, p.6-7) propose a «relational» view of technology, underlining two aspects. The first relates to the fact that the distinction between human and technological factors is never clear-cut: there are always specific ways in which we are changed, cultural and psychologically, by the technologies we use; besides, there is also a material and very concrete relationship with our body and physical environment so that, to some extent, in this relational framework, we do not rethink just the nature of technology but our very nature as well. The second aspect is the recognition that technology usages are always bound up with complex sets of other social practices and processes. Brigite Juanals adds to this the idea that, by integrating the thinking processes of their users, the material and logical tools should now be viewed as intellectual tools for the mediation of information and knowledge so that, in this perspective, they have become cognitive tools (Juanals, 2003, p. 12).

Only backed by these cautionary reflections it is possible to rethink the access question beyond the mere possibility of using computers or having a connection to the Internet, a definition which reduces the problem to a technical stance that has been translated into public or sponsoring initiatives for providing online access to dwellings, schools, libraries, etc. Such initiatives, obviously indispensable, assume access issues in a very limited and clearly insufficient way, if the potential users do not have opportunities to develop the necessary skills and attitudes to make the most of such resources. Therefore, the major problem of such an interpretation resides in its prevailing orientation towards hardware.

It is undeniable, and has been patent in several analyses (van Dijk, 2005b, 2003; van Dijk & Hacker, 2003; Warschauer 2003a, 2003c; DiMaggio & Hargittai, 2001; Hargittai, 2002; Bucy & Newhagen, 2004) that the great problems of information and communication inequality emerged precisely with the general diffusion of computers

and the Internet. But this should not lead to the confusion between technical and cognitive access to knowledge, implying that «technical knowledge would have, on its own, the important and peculiar power to augment the intellectual capabilities of their users...»; yet, this is a recurrent position in the discourse about communication and subsumes the «ideological belief in technical objects and networks» (Juanals, 2003, p.17).

Thus, after hundreds of research and political conferences devoted to theme between 2000 and 2004, the emerging difficulties with the scientific notion of digital divide came at no surprise. Many researchers started to call for a re-conceptualization of the excessively open-ended notion of digital divide and to pay greater attention to its social, psychological and cultural background (van Dijk, 2005a), leading to the emergence of a consensus around motivation, physical access, skills and usage as the key factors of the new models of behaviour in the information society: the multidimensional notion of access would have greater relevance for the participation in the decisions of a democratic society (Hacker & Van Dijk, 2000; Marsh 2001), community life and civic commitment (Steyaert 2002; Viherä, 2000), labour market (Steijn 2003), electronic commerce (Fructuoso van der Veen & de Haan 2003) and other forms of social participation (De Haan, 2004).

This trend towards widening and complexifying the access concept is the basis upon which van Dijk has developed his cumulative and recursive model of successive types of access to digital technologies. The model argues that the initial stage of access, viewed as a process of full appropriation of new technologies, is the motivational access and that it is a preliminary condition of all subsequent stages. It can be characterized by the absence of basic digital experience, caused by the lack of motivation from the part of potential users to adopt, acquire, learn and use new technologies, computers and the Internet in particular. In fact, mental barriers to access have been overlooked in the the digital divide debate, while it is well known that motivation should not be taken for granted: «some people are not intense seekers of information and communication. Others do not like computers and are not attracted to the Internet», simply for lack of interest in or anxiety towards computers. Even in the most developed countries there are large segments of the population with very poor digital experience and «about 20% of the adult population declines to use computers.» (van Dijk, 2005b, p.27). In the turn of the century, German and American research studies (ARD-ZDF, 1999 e NTIA, 2000) provided evidence about the main reasons for such a rejection, consisting in the absence of need or opportunity of use; lack of time or inclination; rejection of the medium (the Internet and computer games viewed as «dangerous media»); and shortage of means and skills. Furthermore, as noted by van Dijk (2005a), the combined results of several European and American surveys carried out between 1999 and 2003, revealed that half of the population without an Internet connection at the time had responded explicitly that they would refuse such a connection for one or several of the above reasons (ARD-ZDF, 1999 and Lenhart *et al*., 2003).

These data contradict, and lead to the abandonment of one of the more confusing and persistent myths regarding the digital divide: that people are either included or excluded, i.e., they are integrated or not. Actually, in order to capture its dynamic, the digital divide has to be represented as an access spectrum, ranging from those who have full access and use the best technologies available in the market of developed countries to those who are completely «disconnected», including in between the intermittent

users, the dropouts (people who have more or less permanently lost connection to the Internet, voluntarily or not) and net-evaders (van Dijk, 2005b, p.31-35; van Dijk & Hacker, 2003). Thus, the problem of motivational access rises in importance with the recognition that there are not only *information have-nots* but also *information want-nots*.

The material (van Dijk, 2005b; van Dijk & Hacker, 2003), technical (Kling, 1998; Juanals, 2003; Burbules & Callister, 2000) and technological access (Bucy & Newhagen, 2004), or its technical means (DiMaggio & Hargittai, 2001) are the second stage of access, characterized by the availability of computers and network connections. However, Van Dijk differentiates material access into *physical* access and *conditional* access. Physical access refers to the possibility of someone having operational hardware, software and computer services, networks and other digital technologies. Conditional access consists of provisional availability of specific applications, programs and content, thus stressing even more that just physical access alone is not enough. Certain programs and content, besides specific software and media like CD or DVD, require also usernames and passwords, and the fulfilment of conditions that reveal a particular position, like membership or payment. Therefore, «conditional access becomes ever more important for material access» (van Dijk, 2005b, p.48). Another important distinction regarding material access respects to the kind of computer and network connection. Obviously, the kind of access in a traditional domestic computer, an old PC, a small computer in a PDA or other portable device is not the same as having access in an advanced multimedia machine. The same is true for a dial-up connection when compared to an always on broadband connection, via cable, satellite or DSL. All these aspects of physical and conditional access, notably «access conditions, access points, and types of hardware, software and services available for particular users make a tremendous differenceto the potential applications and to the level of inequality between users.» (van Dijk, 2005b, p.49).

The next stage is concerned with the skills, attitudes and disposition needed for an effective use of equipments which, in this framework, are part of the broad concept of access skills (van Dijk, 2005b; Van Dijk & Hacker, 2003). Access skills may face obstacles such as insufficient or inadequate training or absence of social support. Steyaert (2000), van Dijk (1999, 2004 e 2005b) e Van Dijk & Hacker (2003) introduced the concept of *digital skills* as a succession of three types of skills. The most basic level is that of *instrumental* (Steyaert) or *operational* (van Dijk) skills, the most common definition of which refers to the ability to operate computer and network hardware and software. This level of skills has been under enough attention, yet in the belief that once they have been fulfilled all skills problems will be over. Yet, as many researchers have pointed out, there are several types of informational skills required for the successful use of computers and the Internet. Steyaert distinguishes between *structural* and *strategic* skills, and van Dijk proposes a similar distinction, between *informational* and *strategic* skills (van Dijk, 2005b). Informational skills respect to abilities in information searching, selecting and processing using digital equipment and software. Van Dijk provides further distinction between *formal* information skills, i.e., the ability to work with the formal features of a medium (which in computers are disks, files and programs, as well as Web sites and hyperlink structures) and *substantial* information skills, such as the ability to search, select process and evaluate information from specific sources to answer particular questions (van Dijk, 2005b, p.81). Finally, the *strategic* skills referred to by Steyaert and van Dijk can be defined as the ability to use computers and the

network as means to attain given objectives and to improve one's position in society, by searching, processing and using information on one's own initiative. This is about goal-oriented behaviour, usually in the context of work, job, educational and political careers, social relationships and recreational activities. Together with strategic skills, such a goal-oriented behaviour in the use of computers and networks is «vital in the information and network society. In this society, an increasing number of activities is affected by purposive searching, processing, and use of information and by attaining or retaining positions in all kinds of relationships. Those able to search, process, use, attain, and retain will have a considerable advantage in social competition and educational or job careers.» (van Dijk, 2005b, p.88).

The last and decisive type of access is *usage access*. Indeed, the motivation, physical access and skills needed to use digital media are the necessary but not the sufficient conditions for their effective use. Usage has its own grounds and determinants. It is perfectly possible for a person who is motivated to use computers and the Internet, has physical access to equipments and the network and the necessary skills for their use, not to have the need, occasion, obligation, time or effort to use them. Besides, as usage access is a dependant factor, it can be measured in four modes: usage time; usage of applications and their diversity; usage of broadband or narrowband, and usage with more or less degree of creativity (van Dijk, 2005a).

According to the model being followed, the problems of access to digital technologies move gradually from the first to the last two types of access. It may happen that when (and whether) problems of motivational and material access are solved, totally or in part, the problems of skills and of structurally different usages will emerge in their actual importance. The analyses by Eszter Hargittai of the differences *among* Internet users have provided evidence of a second level of the digital divide, regarding the specific skills to use the medium effectively (Hargittai, 2002 e 2003). In fact, different uses of information and communication technologies are related to the most important digital and informational inequalities in society, and the usage gap can even stretch. It is at the level of usage access, which is the final objective of all the new media appropriation processes, that the «Matthew effect» finds its strongest and long-lasting impact. The Matthew effect is a term coined by Robert K. Merton (1968 e 1988) which definition, in a simplified form, states that those starting from a significant amount of resources take more benefit from a new resource than those starting from a less advantaged position.

In the case of access to new media, the existing background consists of material, mental, temporal, social and cultural resources and the new resource is the potential value of possessing and using computers and networks. This is the level at which all the inequalities occurring at other preceding levels will appear together. A consequence of this is the mixing of all economic, social, cultural and political inequalities already in place. According to some researchers, inequalities at the motivational, material and skills access may reduce partially, while usage inequalities will be more difficult to eradicate and, quite the contrary, will tend to increase (van Dijk (2005b, 2004; Van Dijk & Hacker 2003; DiMaggio & Hargittai, 2001).

While the use of computers and the Internet reflects even more family, social and cultural differences and inequalities, it is also true that it can contribute to aggravate

them because «the digital media function as tools and trend amplifiers» (van Dijk, 2005b, p.130).

Ours is a society in which information is a basic good for everyone. However, everyone needs also a cultural and social capital to be able to adequately use information, i.e., skills to select and process information in order to use it in the position one occupies in the network. It is well known how these types of «capital» are unequally distributed. Furthermore, information is a positional good (van Dijk, 2005b; Van Dijk & Hacker 2003), meaning that, despite the so-called *information overload*, in certain circumstances it can be an extremely scarce good; and that, even more important is to obtain information in first hand, in terms of either economic or social and cultural competition. The importance of cultural and social capital for extracting relevant information from a variety of sources and using it to improve one's position is even more crucial in the network society. In this context, being inside or outside the network is a vital factor, because it defines one's opportunities and power in society: «having no access to these networks means absolute exclusion. Obtaining a more or less central position inside networks entails relative exclusion.» Van Dijk, 2005b, p. 160). The position acquired at work, in the school, at home and within the local community also determines the chances of acquiring basic digital experience, of developing additional skills and using specific applications. The third type of digital skills mentioned above, strategic skills, i.e., the ability to use digital means to improve our position in society, at work, in education and in cultural practices, is closely related to the possession of social capital and resources and is at the core of usage access (Van Dijk & Hacker, 2003).

The digital divide is a concrete phenomenon, at the same time empirically evident and complex and diversified. It is not about an absolute and unsolvable division between two classes of persons. In fact, the imbalances observed show that differences are relative and gradual. These characteristics do not diminish the importance of the problem, as in the information and network society differences in getting information and having communication channels are nowadays more decisive for one's position in society than in any other historical situation. The main policy task will be not only to prevent the augmentation of existing structural inequalities in skills and usage of new technologies, «but to prevent them from becoming fixed and structural» (Van Dijk, 2005b, p.180). Another reason for the complexity of the digital divide is that, in fact, several divides exist and while some of them are increasing others are reducing, each of them presenting a dynamic nature of its own.

The question at stake is to know whether or not the diffusion of new technologies across the social tissue, and the emergent notions of network and hypertext, have changed the society's levels of demand, hence the skills required for diversified social functions; and, accordingly, whether the very notion of classic literacy, closely linked to our traditional values of the print culture, will not need to be re-conceptualized.

Literacy in the era of the new media

For many authors, the ongoing digital revolution stresses the investigation of literacy on aspects other than those limited to skills for reading, writing and calculation, to take into account issues of access and abilities for handling digital media. Our current

environment is indeed a new one, a world in permanent change, modelled and mediated by new information and communication technologies. Speed, instantaneousness, flexibility, mobility, experimentation and change are just some of the features that pervade not only the literacy on the Web but also our social and cultural practices. According to Ilana Snyder, many of these features can be described as an integral part of a new communicational order, itself a component of the technological revolution that is reshaping the material grounds of society. New technologies have interacted with all facets of life, though in uneven modes, in different areas of the world: from the form and structure of our communities to the organization of education, from the structure of family to the statute of art and entertainment (Snyder, 2003). The emergence of this new order is closely linked to the development of an electronic system of communication characterized «by its global reach, its integration of all communication media, and its potential interactivity» Castells (1996, p.329).

Gunther Kress considers that the ongoing revolution in communication compels us to rethink the social and semiotic landscape of the so-called "advanced" Western societies. In this moment of the long history of writing, four ongoing changes are particularly important – social, economic, communicational and technological - which combined effects are so profound that «is justifiable to speak of a revolution in the landscape of communication.» This revolution is causing long-term effects on the usages, functions forms and appreciation of alphabetical writing. Social changes are pulling down the structures and frameworks that have provided the forms of writing with a relative stability in the last centuries. Economic changes are modifying the usages and purposes of the writing technology. Communicational changes are transforming the relationship between the means used to represent meaning, bringing image to the centre of communication and thus defying the field of writing. Finally, technological advances are changing the role and meaning of major dissemination media. Therefore, «the screen is beginning to take the place of the book, and this is unmaking the hitherto "natural" relation between the mode of writing and the medium of the book and the page.» (Kress, 2003, p.9).

In fact, the media transformation brought about in the 20th century by computing and communication networks gave rise to profound alterations in the modes of assembling and organizing information, henceforth overly multiplied, fragmented, unstable and in permanent increase. Mediation devices are also profoundly changed in their availability and modes of operation: «The reader-listener-viewer is now facing continuous flows of messages, the amount and transmission pace of which have become, paradoxically, handicaps to their diffusion and reception. (...) In the shift from books to computerized devices information becomes dynamic, propagated, mobile, support-independent, hypertextual, multimedia and interactive....» (Juanals, 2003, pp.10-13).

These and other authors,[2] though using different terminology of their own, present congruent views about the need to develop further the traditional definition of literacy, now rendered too narrow to capture the complexity of the actual practices of contemporary societies. In this respect, two aspects are usually mentioned. One is the development of information and communication technologies in the context of wider economic and social changes. For Juanals, in the computing environments the evolution

[2] See, for exemple, the research of The New London Group and Bill Cope & Mary Kalantzis (eds), *Multiliteracies*, 2000.

of «storage, processing, transmission and access was such that affected the very definition and nature of information: transcribed information cannot exist without its inscription media which material properties influence its preservation and diffusion, the reading paths and sense making processes» (Juanals, 2003, p.16). Another aspect is the shift from a domination of writing to a domination of image, from the prevalence of the book to that of the screen medium. As stated by Kress (2003, p.1), it is already clear that «the combined effects on writing of the dominance of the mode of image and of the medium of the screen will produce deep changes in the forms and functions of writing. This in turn will have profound effects on human, cognitive/affective, cultural and bodily engagement with the world, and on the forms and shapes of knowledge.»

Despite writing and image being resources of a different kind, thus requiring different skills for usage and design, the two modes are more and more used together in new technologies, meaning that we are involved « in the *use* of the resources of visual composition (layout), in the *use of the visual mode of image,* in the *use of the mode of writing*, and all in the ways which both draw on the existing knowledges and resources and yet are also quite new» (Kress, 2003, p.24). What is occurring is the emergence of multimodal texts, constructed from elements which modes have each a different logic. This mixing of different logics raises a variety of issues for reading and for writing design as well.

In conclusion, following Snyder (2003), this new communicational order takes into account literacy practices linked to screen-based technologies and assumes reading and writing practices, traditionally understood as print-based and logo-centred, as just one fraction of what people have to learn to become literate. Indeed, for the first time in history, the different modes of human communication, writing, orality and the audiovisual became integrated in the same electronic system. Being literate in the context of these technologies involves understanding how different modes combine in order to produce meaning. By providing access to these multimodal systems, the Internet and the Web have become an integral part of the new order of communication (Snyder, 2003).). In the digital world, all this reaches us in an undifferentiated manner. According to Castells, multimedia captures «*most cultural expressions, in all their diversity*. Their advent is tantamount to ending the separation, and even the distinction, between audiovisual media and printed media, popular culture and learned culture, entertainment and information, education and persuasion. Every cultutal expression, from the worst to the best, from the most elitist to the most popular, comes together in this digital universe that links up in a giant, a historical supertext, past, present, and future manifestations of the communivative mind», creating «a multifaceted semantic context made of a random mixture of various meanings» (Castells, 1996, p.372 and p.371).

In the era of new technologies and new media, literacy is a very complex phenomenon, no longer just about deciphering texts, rather about understanding how meaningful information is codified. Finding the language adequate to discuss these new practices, to understand the production modes of meaning and devising their theoretical framework are some of the challenges for literacy in the 21th century.

This context gave rise to idea of information literacy, developed since the 70s. The expression, however, has been marked by undeniable ambiguity and a variety of meanings. As confirmed by David Bawden and Lyn Robinson, «information literacy»

has been used in very loose and sometimes confusing ways. In fact, the term that first appeared in this context was computer literacy, in the *Washington Post* in 1981, with the strict meaning of computational skills, notably forms of basic operations with the machine such as starting a computer, opening a folder and saving a file (Warschauer, 2003c, p.111). Other terms followed, with the same or similar meanings: *library literacy*; *media literacy*; *network literacy* or *digital literacy*.[3] In the face of such a profusion, a distinction is needed between literacies that require basic technical skills («*skills-based literacies*»), as in computer or library literacy which point to skills for handling information in a particular device, context or format, and broader conceptions encompassing capabilities other than the ability to retrieve and transmit information. These can include digital literacy, emphasizing the use of information in a digital format, or media literacy (*mediacy)* stressing the ability to deal with information in different media. Thus, following Bawden and Robinson, information literacy should be understood in a much more comprehensive manner than simply forms of advanced computational skills or library training: «to deal with the complexities of the current information environment, in particular the new forms of information products generated in the move to a largely digital information space, a complex and broad form of literacy is required. It must subsume all the skill-based literacies, but it cannot be restricted to them. Nor can it be restricted to any particular technology or set of technologies, and understanding, meaning, and context must be central to it. This implies that training for information literacy must be correspondingly broad, and must take different forms according to its context.» (Bawden & Robinson, 2002, p.298).

We find ourselves in a changing information environment offering a multiplicity of sources to evaluate and choose from, forms of access rendered much more complex due to the variety of computerized devices, where several plurimedia and multimedia formats co-exist, where knowledge develops online stressing the demands of long-life learning. For Juanals, there are several perspectives to consider about how people adapt to all these changes. Accordingly, she proposes three progressive levels of skills in the framework or informational literacy. The first level deals with the *control of access to information* and requires «training in technical and methodological aspects of digitized documentary information: technical access to computerized devices, evaluation, selection, effective and critical usage of information»; the second concerns *literacy of access to information*, which in addition to technical and documentary skills, «presupposes the ability to make an autonomous, critical and creative use of information, possibly generating new knowledge»; finally, *information (or informational) literacy,* meaning «a level of general literacy, knowledge of media, an articulation of ethical considerations and a status of social integration, thus reaching far beyond computer and documentary skills». Juanals underlines that *literacy of access to information* seems nowadays indissociable from the regular (though not exclusive) use of a computerized device and this is changing the conditions of access, now dependent of technical devices. These new environments are viewed as an operative apparatus for the mediation of information and knowledge, therefore as cognitive tools eligible as areas of development in education and science. The importance of such an apparatus, which has rendered even more technical the relationship between individuals and information, should not be overlooked because «human retrieval action and access to data is now affected by the performance of the software and hardware of technological environments.» We have, thus, «evolved from a transmission model to an apparatus of

[3] Warschauer (2003c, p.111-119) provides an extensive and up-to-date list of types of literacy related to working with computers and the Internet.

knowledge mediation, which production study cannot be disconnected from reception as the mode of realization of cognitive possibilities. (...) Therefore, *information literacy* implies the consideration of information in all its concurrent aspects, mathematical, communicational and social, because the technical specificities are determinant for the changes in access and usage modes» (Juanals, 2003, pp.24-30).

In this same perspective, Douglas Kellner states that the new multimedia environments require a range of multi-semiotic and multimodal interactions, involving the relationship with texts, images and sound in a variety of records (print, or other analogue forms, and digital). Because the technological convergence is developing at a fast pace, there is a need for combining the abilities of a critical literacy of media with the traditional literacy of the print, and with new forms of multiple literacies for accessing and navigating the new multimedia environments. Thus, the concept of *multiple literacies* points to «the many different kinds of literacies needed to access, interpret, criticise, and participate in the emergent new forms of culture and society.» It also involves «reading across varied and hybrid semiotic fields and being able to critically and hermeneutically process print, graphics, moving images, and sounds. The term "hibridity" suggests the combination and interaction of diverse media and the need to synthesise the various forms in an active process of the construction of the meaning.» (Kellner, 2002, p.163). In this way, as noted by Ilana Snyder and Catherine Beavis, the new literacies connected to the use of information and communication technologies do not mean a break with the past: the old and new interact in complex ways, producing hybrid practices (Snyder & Beavis, 2004, p.xvi). Furthermore, as underlined by Kellner, although discontinuities and innovations can be observed in the current literacy constellation, there are also important continuities, rejecting the idea that the era of the book and the literacy of the print have reached the end. Much to the contrary, in the new technological environment, «traditional print literacy takes on increasing importance in the computer-mediated cyberworld as people need to critically scrutinize and scroll tremendous amounts of information, putting new emphasis on developing reading and writing abilities» (Kellner, 2002, p. 158).

The term literacy should always subsume the means used in a productive commitment to forms of communication and representation that are socially raised. For Snyder, a core target for success in education for literacy in the electronic era consists not only in providing opportunities for people to learn to communicate in more effective ways but also to develop a more critical and informed attitude towards the disintegration of the conventional perspectives about the world, world orders and social formations, a process mediated and accelerated by the availability of increasingly sophisticated electronic technologies (Snyder, 2002, p.181).

This is the perspective taken by Luciano Floridi to suggest that the fundamental task is formulating an ethic for the *infosphere*.

Conclusion. Towards an ethics of information for the infosphere

An ethics of information for the *infosphere* should be able to answer the new ethical challenges elicited by such an environment, upon the fundamental principles of respect for information, its conservation and valorisation. Following Floridi (2202b), the digital

divide disempowers, discriminates, and generates dependency. It can engender new forms of colonialism and apartheid, and is the source of most of the ethical problems that emerge from the development of the information society. It results from the combination of an horizontal and a vertical gap. The vertical gap separates us from past generations, and signals the end of modernity. That is, while the modern mind used to deal with reality in order to exert control over and to modify it, the informational mind builds its own reality so that, in dealing with it, it actually deals with its own artefacts. It follows from this that the digital divide is not just a vertical gap between present and past generations, it is also a new horizontal gap within hu manity between inside rs and outsiders.

Floridi insists that the infosphere is not a geographical, political, social or linguistic space, but «the atopic space of mental life, from education to science, from cultural expressions to communication, from trade to recreation. Its borders cut across North and South, East and West, industrialised and developing countries, political systems and traditions, younger and older generations, even members of the same family.». (Floridi, 2002b, p.40

The infosphere appears as a transversal environment essentially intangible, but not «any less real or vital». The ethical issues it originates are best understood as environmental problems and comprise «education as capacity-building training; preservation, dissemination, quality control, reliability, free flow and security of information; enlargement of universal access; technical support for the creation of new digital "spaces"; the sharing and exchanging of public contents; respect for diversity, pluralism, ownership and privacy; ethical use of ICT; integration of traditional and new ICT. To alleviate these and similar problems we need a robust ecological approach, which can provide a coherent guidance for the equitable development of this new space for intellectual life. In short, we need an information ethics.» (Floridi, 2002b, p.41). It assumes an attitude opposed to any kind of *destruction, corruption, pollution, depletion* (in quantity, content, quality and value) or *unjustified closure* of the infosphere, designated by Floridi as *information entropy*.

The socio-cultural grounds of the digital divide are so dramatic and unquestionable that nobody has the right to underestimate them. However, it may be fair to argue that, on a global scale, problems such as basic access to food, health, education and respect for fundamental human rights should be our major concern[4]. Yet, what needs to be stressed here is that «underestimating the importance of the DD, and hence letting it widen, means exacerbating these problems as well. In a global context, where systemic synergies and interactions are escalating, no significant problem comes in isolation; no crucial issue can be solved without considering the whole system of relations in which it is embedded.» (Floridi, 2002b, p.40.). In other words, the digital divide is so deeply entangled with so many other social issues that probably what is first at stake is not the digital divide itself, but the battle for its realistic understanding. Only then we can really fight the very digital divide, which must be prevented, opposed and ultimately eradicated, for building an equitable information society for all.

[4] For a brief summary of the question, see Gruenwald (2001).

References

ARD/ZDF-Arbeitsgruppe Multimedia. (1999). Nichtnutzer von online: Einstellungen und zugangsbarrieren. Ergebnisse der ARD/ZDF-offline-studie 1999 [Online nonusers: Attitudes and access barriers. Results of the ARD/ZDF offline study 1999]. *Media Perspektiven*, 8, 415-422.

Bawden, D.; Robinson, L. (2002). Promoting literacy in a digital age: approaches to training for information literacy. *Learned Publishing*, 15 (4) October, 297-301.

Bucy, E.; Newhagen, J. (2004). Routes to Media Access. In Bucy, E.; Newhagen, J. (Eds.). *Media access: Social and psychological dimensions of new technology use*. London: Lawrence Erlbaum, 3-23.

Bucy, E.; Newhagen, J. (Eds.) (2004). *Media access: Social and psychological dimensions of new technology use*. London: Lawrence Erlbaum.

Burbules, N. C. (2002). The Web as a Rhetorical Place. In Snyder, I. (ed.), (ed.), *Silicon Literacies. Communication, Innovation and Education in the Electronic Age*, London and New York: Routledge.

Burbules, N. C. (1998). Rethorics of the Web: hyperreading and critical literacy. In Snyder, I. (ed.), *Page to Screen. Taking Literacy into the Electronic Era*. London and New York: Routledge.

Burbules, N. C.; Callister, Jr., T. A. (2000). *Watch It. The Risks and Promises of Information Technology for Education*, Oxford: Westview Press.

Callister, Jr., T. A.; Burbules, N. (2001). *Be Careful What You Ask For: Paradoxes About the "Digital Divide"*. Presented at the American Educational Studies Association. Disponível em http://faculty.ed.uiuc.edu/burbules/papers/aesa3.html.

Carvin, A. (2001). Mind the Gap: The Digital Divide as the Civil Rights Issue of the New Millennium. *Multimedia Schools*, 7(1): 56–8.

Castells, M. (1996). *The Rise of the Network Society, Volume 1, The Information Age: Economy, Society and Culture*. London: Blackwell Publishers).

Chandler, D. (1994). *Biases of the Ear and Eye: Great Divide Theories, Phonocentrism, Graphocentrism, and Logocentrism*. Disponível em http://www.aber.ac.uk/media/Documents/litoral/litoral.html.

Compaine, B. (2001). *The Digital Divide: Facing a Crisis or Creating a Myth?* Cambridge, MA: MIT Press.

Cope, B.; Kalantzis, M. (eds) (2000). *Multiliteracies: Literacy Learning and the Design of Social Futures*. London: Routledge.

Crandall, R. (2001). Universal Service, Equal Access, and the Digital Divide. *Hitachi Public Affairs Forum: Bridging the Digital Divide*. California Council on Science and Technology, 29-38.

De Haan, J. (2004). A multifaceted dynamic model of the digital divide. *IT&SOCIETY,*. 1 (7), 66-88.

De Haan, J.; Huysmans, F. (2002a) *Van Huis uit Digitaal; Verwerving van Digitale Vaardigheden Tussen Thuismilieu en School*. [Digital Life Starts at Home; the Aquisition of Digital Skills between the Home and School]. Den Haag: SCP.

De Haan, J.; Huysmans, F. (2002b) 'Differences in Time Use between Internet Users and Non-users in the Netherlands'. *IT&SOCIETY,* 1 (2), 67-85.

De Haan, J.; Rijken S. (2002). The Digital Divide in the Netherlands: The Influence of Material, Cognitive and Social Resources on the Possession and Use of Its. *Electronic Journal of Communication*, 12 (1&2).

De Castell, S.; Luke, A. (1986). Models of Literacy in North American Schools: Social and Historical Conditions and Consequences. In: De Castell, S;. Luke, A. (eds), *Literacy, Society, and Schooling*. New York: Cambridge University Press, 87–109.

Debray, R. (2000). Les révolutions médiologiques dans l'Histoire. *Bulletin des bibliothèques de France*, 45 (1), 4-12.

DiMaggio, P.; Hargittai, E.; Celeste C. & Shafer, S. (2003). *From Unequal Access to Differentiated Use: a Literature Review and Agenda for Research on Digital Inequality*. Working Paper #29. Princeton, N.J.: Princeton University Center for Arts and Cultural Policy Studies. Disponível em http://www.princeton.edu/~artspol/workpap29.html.

DiMaggio, P.; Hargittai, E. (2001). *From the "digital divide" to "digital inequality": Studying Internet use as penetration increases*. Working Paper #15. Princeton, N.J.: Center for Arts and Cultural Policy Studies. Disponível em http://www.princeton.edu/~artspol/workpap/WP15%20-%20DiMaggio+Hargittai.pdf.

Feenberg, A. (1991). *Critical theory of technology*. New York: Oxford University Press.

Floridi, L. (2002a). On the Intrinsic Value of Information Objects and the Infosphere. *Ethics and Information Technology*, 4, no.4, 287-304.

Floridi, L. (2002b). Information Ethics: An Environmental Approach to the Digital Divide. *Philosophy in the Contemporary World* 9 (1), 39-45. Disponível em http://www.wolfson.ox.ac.uk/~floridi/.

Floridi, L.(1999). *Philosophy and Computing. An introduction*, London and New York: Routledge.

Fructuoso van der Veen, V.; de Haan, J (2002). E-commerce. In: de Haan, J. ; Steyaert, J. (eds). *Jaarboek IT en Samenleving 2003* [Yearbook IT and Society 2003], Amsterdam: Boom, 133-151.

Gee, J.P. (1996). *Social Linguistics and Literacies*. London: Taylor and Francis.

Graff, H.J. (1987). *The Labyrinths of Literacy: Reflections on Literacy Past and Present*. London: Bodley Head.

Greco, G.M.; Floridi, L. (2004). The tragedy of the digital commons. *Ethics and Information Technology*, 6, 73–81.

Gruenwald, J. (2001). Seeking answers to the global 'Digital Divide'. *Inter@ctive Week*, January 16. Disponível em http://www.zdnet.com.au/news/business/0,39023166,20108161,00.htm.

Gunkel, D. (2003). Second thoughts: toward a critique of the digital divide. *New Media & Society*, .5 (4), 499–522.

Gunkel, D. (2001). *Hacking Cyberspace*. Boulder, CO: Westview Press.

Hacker, K.; Van Dijk, J. (Eds) (2000). *Digital Democracy, Issues of Theory and Practice*. London, Thousand Oaks, New Delhi: Sage.

Hargittai, E. (2003). The Digital Divide and What To Do About It. In: Jones, D. C. (ed.), *New economy handbook*. San Diego, CA: Academic Press, 822-840.

Hargittai, E. (2002). Second-Level Digital Divide: Differences in People's Online Skills. *First Monday*, 7 (4). Disponível em http://firstmonday.org/issues/issue7_4/hargittai/index.html.

Jarboe, K. P. (2001). *Inclusion in the information age: Reframing the debate*. Athena Alliance. Disponível em http://www.athenaalliance.org/pdf/AA901_Report.pdf.

Juanals, B. (2003). *La culture de l'information. Du livre au numérique*, Paris: Lavoisier.

Kellner, D. M. (2002). Technological Revolution, Multiple Literacies, and the Restructuring of Education. In Snyder, I. (ed.). *Silicon Literacies. Communication, Innovation and Education in the Electronic Age*, London and New York: Routledge, 154-169.

Kling, R. (1998). *Technological and Social Access on Computing, Information and Communication Technologies*. White Paper for Presidential Advisory Committee on High-Performance Computing and Communications, Information Technology, and the Next Generation Internet. Disponível em http://rkcsi.indiana.edu/archive/kling/pubs/NGI.htm.

Kranzberg, M. (1985). The information age: Evolution or revolution? In: Guile, B. R. (Ed.). *Information technologies and social transformation*. Washington, DC: National Academy of Engineering, 35-54.

Kress, G. (2003). *Literacy in the New Media Age*. London and New York: Routledge.

Lacy, D. (1983). Reading in an Audiovisual and Electronic Era. In: Graubard, Stephen (ed.), *Reading in the 1980s*. New York: R. R. Bowker, 117-127.

Lenhart, A.; Horrigan, J; Rainie, L., Allen, K.; Boyce, A.; Madden, M., *et al*. (2003). *The ever-shifting Internet population: A new look at Internet access and the digital divide*. Washington, DC: Pew Internet and American Life Project.

Lyman, P., Varian, H.R. (2003). *How much information 2003*. Berkeley (CA): University of California at Berkeley. Disponível em www.sims.berkeley.edu/research/projects/how-much-info-2003/.

Lynch, C. (2001). The Battle to Define the Future of the Book in the Digital World. *First Monday*, 6 (6). Disponível em http://firstmonday.org/issues/issue6_6/lynch/index.html.

Marsh, J. (2001). *Cultural Diversity and the Information Society: Policy Options and Technological Issues*. Brussels: European Parliament, DG for Research.

Mason, S.; Hacker, K. (2003). Applying Communication Theory to Digital Divide Research.. *IT&SOCIETY*, 1 (5), 40-55.

Merton, R. K. (1968). The Matthew Effect in Science: The reward and communication systems of science are considered. *Science*, 159 (3810), 56-63.

Merton, R. K. (1988). The Matthew Effect in Science, II: Cumulative advantage and the symbolism of intellectual property. *ISIS*, 79, 606-623.

National Telecommunications and Information Administration (NTIA) (2000). *Falling through the Net II: Toward digital inclusion*. Washington, DC: US Department of Commerce. Disponível em http://www.ntia.doc.gov/ntiahome/fttn00/contents00.html.

National Telecommunications and Information Administration (NTIA) (1999). *Falling through the Net: Defining the Digital Divide*. Washington, DC: US Department of Commerce. Disponível em http://www.ntia.doc.gov/ntiahome/fttn99/contents.html.

Norris, P. (2001). *Digital Divide: Civic Engagement, Information Poverty and the Internet in Democratic Societies.* New York: Cambridge University Press.

OCDE, *OECD Information Technology Outlook*, Paris: OECD Publications, 2004. Disponível em http://www.oecd.org/dataoecd/20/47/33951035.pdf.

Snyder, I (2003). A new communication order: the challenge for literacy education. *Curriculum Leadership*, Volume 1 Number 29. Disponível em http://cmslive.curriculum.edu.au/leader/default.asp?issueID=9691&id=4621.

Snyder, I (2002). Communication, Imagination, Critique – Literacy Education for the Electronic Age. In: Snyder, I (ed.). *Silicon Literacies. Communication, Innovation and Education in the Electronic Age*, London and New York: Routledge, 173-183.

Snyder, I.; Beavis, C., (eds) (2004). *Doing Literacy Online: Teaching, Learning and Playing in an Electronic World*, Cresskill: Hampton Press.

Souchier, E. (2003). Lorsque les écrits de réseaux cristallisent la mémoire des outils, des médias et des pratiques. *Centre Jacques Cartier conference: The Future of Web Publishing*. Disponível em: http://www.interdisciplines.org/defispublicationweb/papers/18.

Steyaert , J. (2002). Inequality and the Digital Divide: Myths and Realities. In: Hick, S.; McNutt, J. (eds). *Advocacy, activism, and the Internet : community organization and social policy*. Chicago, Ill.: Lycecum Books.

Stewart, A. (2000). Social inclusion: An introduction. In: Askonas, P.; Stewart, A. (editors). *Social Inclusion: Possibilities and Tensions.* London: Macmillan, 1-16.

Street, B. (1984). *Literacy in Theory and Practice*. Cambridge: Cambridge University Press.

Steijn, B. (2003). IT en de Organisate van Arbeid [IT and the Organization of Labor]. In: de Haan, J.; Steyaert, J. (eds). *Jaarboek IT en Samenleving 2003* [Yearbook IT and Society 2003], Amsterdam: Boom, 153-173.

Thierer, A. (2000). How Free Computers Are Filling The Digital Divide. *Backgrounder #1361*. Disponível em http://www.heartland.org/pdf/16405.pdf.

United Nations Development Programme (UNDP) (2001). *Human Development Report 2001. Making new technologies work for human development.* New York-Oxford: Oxford University Press.

Van Dijk, J. (2005a). *From Digital Divide to Social Opportunities*. Paper written for the 2nd International Conference for Bridging the Digital Divide. Seoul, Korea**.** Disponível em http://www.gw.utwente.nl/vandijk/news/international_conference_for_b/051214_from_digital_divide_to.doc/.

Van Dijk, J. (2005b). *The Deepening Divide, Inequality in the Information Society*. Thousand Oaks CA, London, New Delhi: Sage Publications.

Van Dijk, J. (2004). Divides in succession: Possession, skills, and use of new media for societal participation. In Bucy, E.; Newhagen, J. (Eds.). *Media access: Social and psychological dimensions of new technology use*. London: Lawrence Erlbaum, 233-254.

Van Dijk, J. (2003). A framework for digital divide research. *Electronic Journal of Communication/Revue de Communication Electronique*, 12 (1).

Van Dijk, J. (1999). *The network society, Social aspects of new media*, Thousand Oaks, CA: Sage,

Van Dijk, J.; Hacker, K. (2003). The Digital Divide as a Complex and Dynamic Phenomenon. *The Information Society*, 19, 315–326.

Van Dijk, J.; de Haan, J. & Rijken, S. (2000). *Digitalisering van de Leefwereld*. [Digitalisation of Daily Life]. Den Haag: SCP.

Varian, H, R. (2005). Universal access to information. *Communications of the ACM*, Volume 48, Number 10, 65-66.

Viherä, M.L. (2000). *Communication of Every Digital Life- Why, How, by What Means*. Helsinki: Edita.

Warschauer, M. (2003a). Demystifying the digital divide. *Scientific American*, 289 (2), 42-47.

Warschauer, M. (2003b). Dissecting the "digital divide": A case study in Egypt. *The Information Society*. 19 (4), 297-304.

Warschauer, M. (2003c). *Technology and Social Inclusion: Rethinking the Digital Divide*. Cambridge, Mass.: MIT Press.

Warschauer, M. (2002). Reconceptualizing the digital divide. *First Monday* 7(7). Disponível em http://www.firstmonday.dk/issues/issue7_7/warschauer/.

Warschauer, M. (2000). Does the Internet bring freedom? *Information technology, education and society*. 1 (2), 93-201. Disponível em http://www.gse.uci.edu/faculty/markw/freedom.html.

The author would like to thank Maria Inês Cordeiro

José Afonso Furtado was born in Alcobaça in 1953. Graduated in Philosophy by the Faculty of Arts of the University of Lisbon, he holds the position of Director of the Art Library of the Calouste Gulbenkian Foundation since 1992. He is a member of the Advisory Council for Libraries, under the Ministry of Culture, since 1998, and has been a regular lecturer in the Publishing Course of the Faculty of Social Sciences and Humanities of the Portuguese Catholic University, and invited lecturer in the post-graduation course of Intellectual Property Rights, in the Faculty of Law of the same University. Besides a variety of journals articles and conference papers, he has published *O que é o Livro*, Lisboa, Difusão Cultural, 1995, *Os Livros e as Leituras. Novas Ecologias da Informação*, Lisboa, Livros e Leituras, 2000 and *O papel e o pixel. Do impresso ao digital: continuidades e transformações,* Florianópolis (Brazil), Escritório do Livro, 2006.