Technological and Information Literacy is a Necessity for Advancing Societies in Terms of Education and Development

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Abstract

Several assumptions underline the ideas presented in this paper; the societal changes wrought by e-technologies and /or digital technologies will have greater implications for changes in educational programs than will the instructional potential of these technologies. In addition, technology has revolutionized the way that we communicate with each other, the way we use the language, the way we read and write, the way we think the way we teach, the way we behave, (Crystal, 2004, 2008a, 2008b, 2011; Gee, 1996, 2000a, 2000b, 2008; Johnson, 2009; Cope & Kalantzis, 2000; Kress, 2003; Lankshear & Knobel, 2003; O'Brien & Sharber, 2008; Prensky, 2001).

Introduction

Making choices can be understood as a manifestation of late modern society in which individuals engage in a continuous process of self-reflexive expression of their identities that include making choices Giddens (1991). By making choices you express yourself. Numerous alternatives are offered in a growing number of areas of life, and many decisions need to be made. Furthermore, people today, looking for guidance before making choices, have several authorities and expertise with different and sometimes conflicting knowledge claims to turn to Giddenes (1991). The increased number of choices that people need to make may also be understood as expressions of a societal shift in which the relation between state and its citizens changes; the state goes from being a provider of services for the citizens (welfare model), to a state in which the citizens are expected to be active participants in society through the choice they make as consumers (model influenced by neo-liberalism). A citizen is therefore responsible for her or his situation, that is, the sum of all previous decisions. A good citizen makes wise choices. Henderson & Peterson (2002); Fioretos (2009).

Seeking, finding and using information efficiently and wisely are viewed as important abilities; specifically, the ability to evaluate information becomes vital. The term *information literacy* has been coined as a label to describe these abilities. However, the concept can be analyzed as ambiguous, understood both as offering empowerment as it enables people to take part in society and make well-informed choices, and as being demanding as it compels individuals to take responsibility and engage in making choices facing them.

Concept of Computer Literacy

The term "Computer literacy" has evolved over the past twenty years. In part because it is so new, it is a "humpty-dumpty" concept which can mean whatever its users want it to mean. Consequently, the literature abounds with diverse definition of computer literacy and with varied descriptions of school programs for realizing it. Nowadays, computer literacy courses at most universities focused on acquiring knowledge about how computers worked and gaining technical skills in using standard computer applications, such as word processing, electronic spreadsheets, and email (Computer Science Telecommunications Board, 1999). Today students must grasp the underlying principles of the technologies and understand how those principles relate to real-world tasks. Learners must be able to integrate their knowledge of technology skills, analytical skills, and critical thinking skills to solve complex problems.

The Diverse Meanings of Computer Literacy

At a general level, differences in the conceptual and practical meanings of computer literacy exist within and across nations, at a specific level, they are found in the multiple programs offered in given schools.

Diversity expresses itself through the scope and depth of computer literacy programs, the objectives they seeks, the outcomes they produce, and the places they occupy in curricula. Computer literacy programs now found in schools are not easy to classify, in part because they are usually defined in general terms. In addition, those describing programs often fail to distinguish clearly between concepts and their uses, and the resulting obscurities make classification difficult.

Definition of Information Literacy

Among the most commonly employed definitions of information literacy is that from the US-based Association of College and Research Libraries (ACRL), which focuses on specific skill-based outcomes: information literacy is 'a set of abilities requiring individuals to recognize when information is needed and have the ability to locate, evaluate and use effectively the needed information' ACRL (2000).

Dorner and Gorman (2006) took a critical view of this definition of information literacy and emphasized that the western or developed world's definitions and models may not be operational in the developing world. They asserted:

1. It tends to reduce the process to a group of skill sets, and more particularly reduces it to a functional technological skill.
2. It does not question the basic assumption about information, and how it becomes knowledge, assuming the later to be something external that can be tracked down and captured. Dorner and Gorman (2006:284)

Furthermore, they define information literacy as the ability of individuals or groups

- To be aware of why, how and by whom information is created, communicated and controlled, and how it contributes to the construction of knowledge;
- To understand when information can be used to improve their daily living or to contribute to the resolution of needs related to specific situations, such as work or school;
- To know how to locate information and to critique its relevance and appropriateness to their context;
- To understand how to integrate relevant and appropriate information with what they already know to construct new knowledge that increases their capacity to improve their daily living or to resolve needs related to specific situations that have arisen. Dorner and Gorman (2006:284)

According to Eisenberg, Lowe and Spitzer (2004), information literacy considers the broad range of resources that are accessible online and underscores the importance of looking at each of these resources with a critical eye. Shapiro and Hughes (1996) view information literacy as ranging from knowing *'how to use computers and access information to critical reflection on the nature of information itself, its technical infrastructure, and its social, cultural and even philosophical context...'* Whether one chooses to focus information literacy thinking and training on IT literacy, computer literacy, networking literacy, or media literacy, it is important to realize that the terms mask the same basic requirements. While discussing these terms, Webb and Powis (2004) quote Bawden as follows: The name and exact definition matter rather less than a recognition that "to deal with the complexities of the current information environment, a complex and broad from of literacy must be required", which must "be actively promoted as central core of the principles and practice of the information sciences." Bawden (2001:251)

Indeed, this idea of 'a complex and broad from of literacy' is echoed elsewhere. Horton (2007), for example, describes the family of the 21st century 'survival literacies' as including six categories:

1. The Basic or Core functional literacy fluencies (competencies) of reading, writing, oralcy [i.e., oracy], and numeracy;
2. Computer Literacy;
3. Media Literacy;
4. Distance Education and E-Learning;
5. Cultural Literacy; and

6. Information Literacy. The boundaries between the various members of this family overlap, but they should be seen as a closely – knit family. Horton (2007:3)

Also, information literacy refers both to librarians' practices of teaching information seeking with the achievement of information literacy as the intended outcome, and to a research field within library and information science. According to Limberg et al.

(2008) there is an important dichotomy in the literature dealing with the concept, which depends on the targeted audience, librarians and information professionals on one side, and researchers on the other, 'manifested in the professional interest in mediating information literacy and the research interest in conceptualizing information literacy.' Limberg et al. (2008:83). Examples from the librarian professional literature includes definitions of and standards for information literacy with wordings that describe information literacy as "a survival skill in the Information Age" (ALA 1989). In these texts people are often described as facing overwhelming amounts of information as they perform different roles: "in their academic studies, in the workplace, and in their personal lives" (ACRL 2000), and information literacy as cure for this problem. "It empowers people in all walks of life to seek, evaluate, use and create information effectively to achieve their personal, social, occupational and educational goals." Alexandria proclamation (2006).

Many of the previous definitions has been criticized for focusing on list of skills that are generic and without context (Talja, 2005; Touminen, et al. 2005; Lundh&Limberg, 2008; Sundin, 2008). Sundin (2008: 28) identifies an emerging theoretical framework with "interest in how information id given meaning, evaluated, and used within different social practice". However, as remarked by Lloyd and Williamson, empirical studies on information literacy have mostly been carried out in the educational sector (Lloyd, 2007a: 182) and in workplace settings (Lloyd & Williamson, 2008: 4). More empirical studies of information literacy as well as studies in other fields have been called for (Lloyd, 2007b)

Information Literacy and Information Seeking

Conceptually, there undoubtedly is an important overlap between information literacy and information seeking, this is the case whether information literacy is defined instrumentally, as is apparent in various national information literacy standards and the instructional practices of practitioners, or defined more conceptually, as is increasingly apparent in the writings of Lloyd (2006, 2007), for example. There are also differences between the two. Despite the rather obvious connection between people's ability to access the information needed, and the process of information seeking, the relationship between information literacy and information seeking has been largely ignored in the research literature. One explicit exception is the Information Seeking, Didactics and Learning (IDOL) project where 'information seeking as an object of learning is closely related to the concept of information literacy' Limberg and Sundin (2006:3). In highlighting the significance of their work, Limberg and Sundin claimed that "*the research of information seeking and information literacy have not influenced each other in the way that they have potential so to do.*" (2006: 2). Their findings suggest, for example, that 'students learning could be deepened if teachers take a stronger user – or student – centered approach, emphasize the context of information content, and focus on students' information seeking rather than the learning of facts. In another article, which discussed research findings from a series of information seeking and learning projects, Limberg et al., defined information literacy as "*asit of abilities to seek and use information in purposeful ways related to task, situation and context in which information seeking practices are embedded*" (2008:83).

As Wilson's (2000) model proposes, human information behavior includes passive as well as active information seeking, a type not accounted for in the definition of Limberg et al. (2008). In addition, as Williamson (2010) makes clear, information seeking involves more than a '*set of abilities*' or as she termed it, '"*know how" with information*'. She found that online investors, whose information-seeking behavior she investigated, were strongly influenced by availability and speedy delivery of information, making the information provision aspect of information seeking a key factor. Thus *information seeking* extends beyond its use in *information literacy*, as innumerable examples from the ISIC series conferences have indicated. Likewise, information literacy is a border concept than maybe reflected in Limberg's definition above since it is a constituent of a broader *literacy* continuum, which encompasses a range of interpretive and meaning-making abilities. Nevertheless, in information science there is an obvious and close relationship between these two fundamental concepts, information seeking and information literacy.

Information Literacy Practices

In the information seeking domain, there has been recent discussion between Wilson, Savolainen and others (Behavior/practice debate, 2009) about the uses of the terms 'information behavior and information practice'. Lloyd (2010) cited the work of Schatzki (2002) as the key influence on examining the effects of practice on social life, including the educational and workplace context.

Lloyd argued that, using Schatzki's theories, information literacy can be seen as "*a dispersed practice that hangs together as a bundle of information focused activities that are constituted within larger integrative practices*" (Lloyd, 2010:249). In this author's view, information literacy practice by school students represents the information related activities in which students are reflectively engaged while at school or outside school. Thus, the term 'information literacy practice', in the lives of school students, dose not merely represent students engaging in activities such as Web searching or information evaluation; rather it implies that the students reflect on the use of these activities (for example, by selecting particular search strategies and rejecting others).

The main aspect of information literacy practice is information seeking by students. Kuhlthau's (2004) range of research studies focused partly on information seeking and led to the development on the information search process model. Kuhlthau(2004) also introduced a new emphasis on the need to consider the factors which influenced students' information seeking. Herring and Tarter (2007) reviewed three studies on students' use of Herring's (1996) PLUS (purpose, location, use and self-evaluation) model. These studies showed that while a minority of students had relatively sophisticated information seeking skills, most students had a more casual approach to information seeking. Bilal et al. (2008) examined information seeking by school students in digital libraries, and their conclusions include a reaffirmation of Kuhlthau's (2004) findings on uncertainty and satisfaction in relation to information seeking. Alexandersson and Limberg's (2003) research, which takes sociocultural perspective, found that students' information seeking often focused on gathering facts, rather than on deep learning. Limberg et al.(2008) argued that in schools there was a need to focus more on learning goals and meaningful learning for students, rather than the more common information skills approach.

Technology and Education

An enhancement to education that has been extremely successful in recent years is technology. Technology is changing the traditional role that education has played and is producing more independent ways of seeking knowledge. Technology in the traditional classroom setting allows students the opportunities to gain information that would be extremely difficult to obtain otherwise. Technology has even expanded outside the classroom setting to allow students partake in a new form of "*distance education*".

Technology can only enhance the present classroom; an historical example of this enhancement was the invention of the printing press. Before its invention, people were able to read and write, but not much reading and writing occurred. When the printing press was finally introduced, books wear a means of preserving knowledge without relying on memory. Students were able to analyze and reanalyze the information that was presented to them without having to write everything the teacher had said. If present trends continue, it is very likely that the impact of computers technology on education will be proportionate to that of the printing press on writing Withrow (1997:61). This is true with the use of computer technology in education. As new technology increases, old technologies are broadened but not totally replaced.

An alternative to a purely traditional teaching program is to use technology in collaboration with traditional classroom. Technology opens doors to a more productive, hands-on environment that is limited only by the technological components that serve the instruction. At some educational institutions, students are able to see time elapsed, complex scientific experiments that, due to time constrains and other factors, they would otherwise be unable to experience. When viewing from their computers, students can alter conditions to see how the change affects the outcome of the experiment. By doing this, the usual passive form of traditional learning is changed, allowing the student to actively construct their knowledge with less guidance from the teacher. Student became more enthusiastic and motivated when they are involved in the instruction and have a choice of what, how, and when to learn. The information begins to have meaning, and the student then has an incentive to retain and use this information Berge & Collins (1995:1).

Technology redefines the classroom by breaking down barriers that exist within the confined space of a collage campus.

It brings to the classroom the opportunity to involve outside scholars who would normally be unavailable due to travel costs and time schedules. Not only can students meet outside speaker, but technology also offers students the chance to meet other students from different social, cultural, and economic backgrounds using Web-based instruction. This builds what Lorraine Sherry calls "new social skills," because the student learns to communicate and collaborate with widely dispersed people Sherry (1996:9).

This is especially important because education should "transmit the culture values and lessons of the past to [the] current generation; prepare our children for the world in which they will live," Molnar (1997:63). Increased cross-cultural communication and peer interaction can achieve both of these goals.

The incorporation of computers and other technology forces students and educators to became technologically literate if they are to use the system properly. These skills are needed to compete in the constantly changing work environment. Incorporating these skills into the traditional curriculum only benefits those who aspire to do more with their education. Students can gain a competitive advantage in the job market through acquired computer knowledge. Students are offered a chance to learn in a new and exciting technological environment. They increase their skills by becoming capable of adapting to rapidly changing work environments.

Conclusion

Education has changed with the introduction of technology and will continue to change. It has grown from "an orderly world of disciplines and courses to an info-sphere in which technology is increasingly important" (Molnar: 68). The innovative nature of technology, as it continues to change and expand, will require educators and teachers to adapt and change the way they approach teaching and learning. Clearly, the future of education will see a major change with the expansion of technology. However, that change depends on our willingness to adopt technology into educational institutions and the manner in which we administer it.

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