Digital Literacy Education for Digital Inclusion

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INTRODUCTION

Information and communication technologies (ICTs) such as computers and the Internet have widely diffused around the world and become an essential part of everyday life. The use of ICTs at school, work, and home has been increasingly common, transforming everyday activities and shaping a major portion of life experience. In the digital age, basic knowledge and skills in use of ICTs as well as access to them are imperative for individuals to communicate with others, work, personally develop, and gain information. ICTs are becoming an integral element of contemporary society and social change and modifying human interaction and relations (Bure, 2005).

The importance and ubiquity of the Internet and computers raises a wide range of discussions about the nature, notion, education, and various aspects of digital technology-based knowledge and skills, digital literacy, which is vital to develop in the digital world (ETS, 2007). Many people gain transformative benefits from knowing how to perform various tasks on the Internet and computers. However, a great number of people still do not have consistent, quality access to those media, and lack digital literacy (Orrick, 2011). They do not know how to use computers and the Internet, and lag behind in the digital world, thus they do not obtain opportunities for the benefits from knowing it. In addition, they do not gain equal opportunities of taking digital advantages that can enhance their daily life. The inequality in use of ICTs for a wide variety of activities has raised concern about the digital divide, digital literacy gap, and digital exclusion (Seale, 2009; Selwyn, 2006; van Dijk, 2006).

Digital literacy is an important concept and has major implications for current education, culture, society, and community development in the digital age (CRILT, 2009). The development of digital literacy is necessary for people to find information, perform basic tasks, communicate and connect with others, expand social networks online, and gain diverse digital opportunities such as businesses and civic engagement online (Bure, 2005; Orrick, 2011). More importantly, digital literacy education in informal settings for those who are the digitally illiterate is perceived as an important tool to bridge the digital divide and cultural enclaves (Hobbs, 2010), and to contribute to digital inclusion. Digital literacy education for digital inclusion is a crucial tool to offer an equal opportunity and reduce the digital inequality (van Dijk, 2006). This study aims to explore the issues of the digital literacy gap and digital divide and the impacts of digital literacy education (DLE) on the development of digital literacy for those who have a lack of digital literacy. This study also explores the integration of digital literacy education into a digital technology community center.

BACKGROUND

Digital Divide

The digital divide, inequality caused by economic, physical, geographical, and linguistic barriers, has been documented in many studies. Since the Internet became commonplace in the 1990s, concern about the inequality of access to computers and the Internet has raised the discussion on the digital divide. The digital divide refers to the disparity between those who have access to computers and the Internet and those who do not have (Norris, 2001). A variety of factors such as age, gender, race, socioeconomic status, and location have contributed to the digital divide in the adoption and use of ICTs. The early studies of the digital divide discovered that the lack of access to computers and the Internet was typically found among individuals who were low-income and had a low level of educational attainment (Norris, 2001).

DOI: 10.4018/978-1-4666-5888-2.ch208

Fuchs (2008) pointed out that unequal access to and usage skills of ICTs magnified existing socio-economic inequalities. Already socioeconomically marginalized people with limited ICTs resources are less likely to use ICTs and have digital literacy, but more likely to be disadvantaged by a lack of digital literacy in the information society, therefore digitally and socially excluded (Seale, 2009). The lack of skills and knowledge of how to use ICTs is an obstacle to the adoption and use of ICTs (Seale, 2009; Selwyn, 2006; van Dijk, 2006). According to Zickuhr (2013), 34 percent of non-Internet users in the United States expressed that the Internet was not very easy to use. Those who have a lack of digital literacy are alienated from the benefits of the digital opportunities to gain information or communicate and engage with others. However, the development of digital literacy can reduce the digital divide and generate economic and social benefits for the public (Hobbs, 2010).

Digital Literacy

Information and communication technologies (ICTs) are increasingly being engaged in everyday contexts, such as personal and social life and work. The wide use of ICTs in people's everyday life has influenced the changes in the perception of digital literacy (Nawaz & Kundi, 2010). Digital literacy has transformed into an everyday literacy, and is becoming a powerful and necessary means in the digital age (CRILT, 2009). Gilster (1997) defined *digital literacy* as "the ability to understand and use information in multiple formats" (p. 1). *Digital literacy* is often used as an interchangeable term with *digital competence*, *information literacy*, *ICT literacy, ICT skills, digital and media literacy, digital skills, media literacy, and eSkills* (e.g., Crawford & Irving, 2007; Ezziane, 2007; Hargittai, 2005; Hobbs, 2010; Ilomaki, Kantosalo, & Lakkal, 2011; Potter, 2010).

Hobbs (2010) defined digital and media literacy as "a constellation of life skills that are necessary for full participation in our media-saturated, information-rich society" (p. vii). Hobbs (2010) also expanded digital and media literacy as "cognitive, emotional and social competencies, . . . the skills of critical thinking and analysis," and the creativity and active participation through the use of technologies (p. 17). Being digitally literate means not only the development of basic functional skills in use of ICTs but also the enhancement of cognitive, critical, and social competencies (Junge & Hadjivassiliou, 2010).

Digital literacy is conceptualized as the individual's knowledge and skills to use ICTs, perform various tasks using them, access, manage, integrate, evaluate, and create information, and function in a knowledge- and information-based society (Eshet-Alkalai & Chajut, 2010; Hargittai, 2005; Jones-Kavalier & Flannigan, 2008). Digital literacy in this present study refers to the necessary digital skills and knowledge to access and use computers and the Internet (CI) and create content in a variety of digital forms.

In the digital age, people need to develop their digital literacy to use computers and the Internet, perform basic tasks based on those media, and become a digital citizen to participate fully in the digital society (Junge & Hadjivassiliou, 2010). A significant aspect of developing digital literacy is that digital literacy can be utilized as practical values for a wide variety of tasks: for instance, to find information online about jobs, public service, health, and government, to take advantage of digital opportunities such as online businesses and learning, to participate in online community activities, and to take social action online to improve communities (Hobbs, 2010). Given that digital literacy is perceived as a social, political, economic, and cultural product (Nawaz & Kundi, 2010), the lack of digital literacy creates the gap between the digital literacy-haves and the digital literacy-have-nots.

Digital Literacy Gap and Connection

Digital literacy gap is considered one of the important social fairness issues confronting the digital society (Seale, 2009). The disparity in digital literacy was found particularly among the older and less-educated with a low level of digital literacy (Dewan & Riggins, 2005). Although socioeconomic disparities still remain as a significant factor in access to and use of ICTs, the lack of digital skills is also a strong determinant factor for not having an Internet connection (EC, 2011). Those who had access to and frequently used ICTs tended to show better scores of digital literacy, compared to those who did not have (Ilomaki et al., 2011). Those living in marginalized circumstances continue to showing a lack of digital literacy, a contributing factor to the digital divide and digital literacy gap. The lack of

digital literacy was particularly evident among women, and older and unemployed people (Eshet-Alkalai & Chajut, 2010; Hadjerrouit, 2010, Junge & Hadjivassiliou, 2010).

Why the digital literacy gap matters is because those with digital illiteracy can be further marginalized and excluded from digital society in that information, communication, business, and prevailing social functions are more and more being structured on the Internet. The main concern about the digital literacy gap is that those who have been left behind in the digital revolution will have difficulty catching up and will be at a disadvantage for getting digital opportunities and being continuously connected. Cotten and Jelenewicz (2006) contended that economically marginalized racial minorities did not have their capability and chance to perform as digital citizens because of the lack of their digital literacy. The empirical studies of performance differences between various social groups showed that the usability and users' experience in technology use were the main factors that accounted for the observed differences in digital literacy (Eshet-Alkalai & Chajut, 2010; Hargittai, 2005).

Simply having access to ICTs does not mean that people have actual competences to adapt to technologies proficiently and are well-informed. Low-income and homeless people, minority groups, and immigrants show a lack of digital literacy in use of ICTs to search for information online and to use emails that are highly interrelated to everyday life and work (see Hargittai, 2005; Hobbs, 2010). As the Internet and computers have profoundly permeated into society, those individuals also seek digital experience for personal expression and communication. Their circumstances can transfer into digital world. According to Woelfer and Hendry (2010), those who previously had a lack of digital literacy contended that they felt equal to everybody else and more connected to humans after their digital experience. Being connected is an important aspect in today's digital society.

MAIN FOCUS

Digital Literacy Education (DLE)

To narrow the digital literacy gap, digital literacy education is considered the key to reducing the gap, particularly for those who lack digital literacy (Hohfeld et al., 2008; Seale, 2009). The ultimate goal of the DLE as a pedagogical tool is to support the learners' knowledge and skill construction processes through education and enhance their digital literacy to use ICTs (see Potter, 2010). The DLE in this study is based on a structured educational approach to integrate digital literacy into learning and teaching. Digital literacy education primarily focuses on learning and digital opportunities for those who have a lack of digital literacy, their social participation, and the development of foundational knowledge and skills in use of ICTs. The DLE also places the location of the investigation within a community technology center (CTC) to examine digital literacy of center users. It is worthy to initiate digital literacy education in a community-level in order to provide equal opportunities to those who are the digitally illiterate and excluded and to enhance digital citizenship (Morse, 2004; Selwyn, Gorard, & Williams, 2001). Like the necessity of the development of digital competence in formal educational settings such as K-12 (Kindergarten through twelfth grade) and higher education, the enhancement of digital literacy in informal settings should also be emphasized through an effective community education movement (Cook & Light, 2006; Hobbs, 2010). Digital literacy education can be a useful tool to assist those who are digitally illiterate to acquire digital technology skills, and provide them with digital opportunities to become a full participant in society (Cotten & Jelenewicz, 2006; Morse, 2004). Digital literacy education is profoundly related to the links between digital literacy and digital opportunity (e.g. Selwyn et al., 2001) and between digital inclusion and social inclusion, which is connected to citizenship and civic engagement (e.g. Hick, 2006; Kahne, Lee, & Feezell, 2012; Warschauer, 2003).

Theoretical Background

There are several contrasting conceptual approaches to digital literacy. The functional approach to digital literacy centers on people's technological skills to use ICTs (CRILT, 2009; Junge & Hadjivassiliou, 2010). This approach originates from the technological usage and views technology as a value-neutral tool. In contrast, technological determinism focuses on positive or negative impacts and power of technologies to change the society (Nawaz & Kundi, 2010). However, both theoretical approaches of functionalism and technological determinism do not consider the differences

in skills for the use of ICTs among diverse populations (Macleod, 2005; Nawaz & Kundi, 2010; Rogers, 2003).

This current study takes into account the relation between digital literacy and educational, cultural, and community factors. In addition, this study focuses on the structured educational approach to the development of digital literacy that emphasizes learning opportunities, experiences, and practices for the improvement of the necessary skills and knowledge for use of ICTs. The main research question of this study includes whether digital literacy education has an impact on the enhancement of digital literacy of individuals, who are digitally illiterate.

Method

The research was conducted at a unique community resource center in a mid-size city of the Southern region in the United States over two months in 2011. The center was used as the site for providing the digital literacy education (DLE) program in this study. Many clients of the center who were mainly low-income and homeless individuals demanded assistance for learning computer and Internet skills, but there were not enough instructors for such assistance. Participants in this study were recruited at the center. Among 145 individuals who participated in this study, 122 participants completed the one-week DLE program and both pre- and post-tests and surveys which were the main instruments of this study. The DLE program was based on fundamental skills and knowledge necessary for use of computers and the Internet in four areas: basic operation of computers and the Internet (operation); Microsoft Word program and creation of résumé (document creation); information search online through a search engine (usage); and e-mail communication and social media use (communication and interaction). For the data analysis, this study used paired samples *t* tests and correlation analysis.

The Impacts of Digital Literacy Education

Around 63% were the male participants in this study, and the average age of the participants was 46 years old. The majority of the participants (83%) were African American and more than 14% of the respondents were White. Nearly half of the participants (48%) had the educational attainment of high school graduate. The results of the paired samples *t* tests indicated the significant differences between the two measurements of pre- and post-tests for digital literacy of the participants after they took the digital literacy education ($M = 1.22$, $SD = 0.47$, $t(121) = 28.544$). In addition, the results of the Pearson's correlation analyses showed that the participants who enhanced their digital literacy through the DLE program tended to spend more time on computers ($r = 0.18$, $p < .05$) and the Internet ($r = 0.30$, $p < .01$), particularly for e-mail use ($r = 0.64$, $p < .01$). According to van Deursen, van Dijk, and Peters (2011), Internet experience positively affected medium-related Internet skills. Experience, practice, and frequent use of computers and the Internet are necessary to improve digital literacy.

Early studies found that age among demographic variables was negatively related to Internet skills, implying that younger generation had better Internet skills than older generation (e.g., Hargittai, 2005; van Deursen et al., 2011). In this present study, age was also negatively related to computer and Internet use and digital literacy. After taking the DLE program, younger participants showed enhanced digital literacy ($r = -0.56$, $p < .01$) than did older counterparts, and tended to frequently use and spend more time on computers and the Internet. Overall, the findings of this study implied that the DLE resulted in the enhanced digital literacy of the participants and had significant impacts on the development of their knowledge and skills in use of computers and the Internet.

This study identified an additional benefit from the improvement of digital literacy, not much discussed in other studies. It includes the connection with family members, relatives, or others through social media. After learning how to use social media through the DLE in this study, some participants could find their lost family members or relatives. In addition, this study found that the digital literacy education program that showed positive impacts on social interaction among the participants could contribute to creating digital culture in a community. After taking the digital opportunity through this study, some participants could help each other use the Internet and computers in the center. They also communicated with each other through email or social media that they learned in this study.

After the participants learned how to use e-mail and social media through this study, these media became the interesting communication tools to them, who

were previously novice in using those media. Many participants expressed that they had not known how to use e-mail and social media until they took this educational opportunity. An interesting finding was that they did not know how to send an e-mail or attach a file to an e-mail even though some of them could create an e-mail account and check their e-mail. Half of the participants expressed that they felt a connection to people, society, and digital culture, after they learned how to use those media and experienced of interacting with others via online.

This study also found that an important factor in the development of digital literacy was the confidence that the digitally illiterate lacked in the use of technology. Those who have little confidence and feel not comfortable in the use of computers and the Internet are less likely to develop their digital literacy (van Deursen et al., 2011). Digital literacy education has the potential of improving the low degree of self-efficacy. In addition, this study discovered that the digital technology community center as an informal setting showed the potential of being an effective place to offer digital literacy education, particularly to those who lack digital literacy.

DISCUSSION, SOLUTIONS, AND RECOMMENDATIONS

Digital Opportunity and Digital Inclusion through Digital Literacy Education

The primary finding of this study is the profound impact of digital literacy education on the development of digital literacy. To gain better information and transformative benefits from the use of ICTs and communicate with others online, the experience of digital technologies and the development of digital literacy are important for those people. Through digital literacy education in this study, the participants gained some benefits such as the development of skills to access information for jobs, health, and local communities.

The main point of this study is the importance of the digital literacy educational opportunity for the individuals who lack digital skills. The results of this study imply that digital literacy education can provide digital opportunities to the digital literacy-have-nots for their needs in daily life (also see Hick, 2006). Digital literacy education can become an important means to help those people improve their knowledge and skills in use of computers and the Internet, increase their regular use of those media, and conduce to digital inclusion. Those individuals can become digitally informed citizens, gain extensive benefits from being digital citizens, and participate in social activities online.

This can ultimately contribute to narrowing the digital literacy gap and the digital divide, empowering those individuals, and thus facilitating digital inclusion (also see EC, 2011; Warschauer, Knobel, & Stone, 2004). Digital inclusion is a matter of ability to use ICTs rather than simply a matter of access to ICTs (Selwyn & Facer, 2007). Digital inclusion also includes equal digital opportunities for benefits from the use of ICTs and the interaction between digital technologies and people (Seale, 2009). Crawford and lrving (2007) emphasized the importance of digital literacy for digital inclusion. Digital literacy education will be able to provide personal, social, and cultural benefits, and help people more deeply engage with and participate in communities and cultural life, thus strengthen digital citizenship and e-democracy and contribute to digital inclusion and social inclusion. The fundamental goal of digital literacy education is to develop individuals' digital skills in use of ICTs and provide them with digital opportunities for digital inclusion.

Digital Technology Community Center for Digital Literacy Education

This study focused on the importance of developing community centers as an informal setting to offer digital literacy education, particularly to the digitally excluded, and to bridge the digital literacy gap within a local context. Hick (2006) emphasized that the community access program (CAP) centers for low income Canadians could be a solution to the digital divide. A digital technology community center (DTCC) can become an ideal place as an informal setting to offer digital literacy education for those who lack digital literacy (Orrick, 2011). Community centers that have been utilized simply as a drop-in center or a deficient computer lab can be replaced as a digital place, where those individuals can learn and develop their digital skills to find information, communicate with others online, gain benefits from the use of digital technology, and enhance their daily lives (Orrick, 2011). The improved digital literacy will enable them to increase

their interaction with others, community, and society, participate in social action and community activities online, and express their opinion and thought about public policies, affairs, and services.

It is worthwhile to develop currently underutilized centers as a digital technology community center, where can create digital culture that those who have a lack of digital literacy perceive empowerment through their developed digital literacy and increase their civic engagement and regular use of the Internet and computers (Hick, 2006; Orrick, 2011). To accomplish those aspects, a DTCC needs to offer less limited hours for access to the center and computers, and provide diverse computer programs with a high-speed Internet connection and more available staff or professionals who can teach digital literacy.

FUTURE RESEARCH DIRECTIONS

This study suggests several directions for future research. To measure variation in digital literacy of diverse population segments, it is necessary to design and create a comprehensive performance test of digital literacy. This will help better understand the disparities in use of ICTs between the digitally literate and the digitally illiterate. To examine the effects of digital literacy education on the development of digital literacy, it is also necessary to discover what segment of the population needs what level of digital literacy education and develop better designs for digital literacy education to be comprehensively adapted to various learners. In addition, it would be better to offer a longitudinal digital literacy education program to participants to more precisely examine the changes of their digital literacy.

CONCLUSION

Digital literacy is profoundly related to education, work, culture, economy, and various aspects of people's daily lives. The development of digital literacy is important and necessary in the digital age. The lack of digital literacy can expand the digital literacy gap and the digital divide. However, digital literacy education through a digital technology community center has the potential of narrowing the digital literacy gap between the digitally literate and the digitally illiterate, and increasing digital inclusion. Those who are digitally excluded because of the lack of digital literacy will be connected to the digital world through the improvement of their digital literacy.

REFERENCES

Bure, C. (2005). Digital Inclusion Without Social Inclusion: The consumption of information and communication technologies (ICTs) within homeless subculture in Scotland. *The Journal of Community Informatics*, *1*(2), 116–133.

Centre for research and innovation in learning and teaching (CRILT). (2009). Digital literacy: New approaches to participation and inquiry learning to foster literacy skills among primary school children. *Digital Literacy In Primary Schools (DLIPS) Report*. National College of Ireland. Retrieved on August 3, 2012 from https://www.ideals.illinois.edu/bitstream/handle/2142/9765/Digital_Literacy_in_Primary_Schools_-_Research_Report.pdf

Cook, J., & Light, A. (2006). New patterns of power and participation? Designing ICT for Informal and Community Learning. *E-learning*, *3*(1), 51–61. doi:10.2304/elea.2006.3.1.51

Cotten, S., & Jelenewicz, S. (2006). A disappearing digital divide among college students? Peeling away the layers of the digital divide. *Social Science Computer Review*, *24*(4), 497–506. doi:10.1177/0894439306286852

Crawford, J., & Irving, C. (2007). Information literacy: the link between second and tertiary projects and its wider implications. *Journal of Librarianship and Information Science*, *39*, 17–26. doi:10.1177/0961000607074812

Dewan, S., & Riggins, F. (2005). The digital divide: Current and future research directions. *Journal of the Association for Information Systems*, *6*(12), 298–337.

Educational Testing Service (ETS). (2007). Digital Transformation: A Framework for ICT Literacy. *A Report of the International ICT Literacy Panel. iSkills*. Retrieved on May 3, 2012 from http://www.ets.org/Media/Tests/Information_and_Communication_Technology_Literacy/ictreport.pdf

Eshet-Alkalai, Y., & Chajut, E. (2010). You Can Teach Old Dogs New Tricks: The Factors That Affect Changes over Time in Digital Literacy. *Journal of Information Technology Education*, *9*, 173–180.

European Commission (EC). (2011). Pillar 6: Digital Competence in the Digital Agenda. *Digital Agenda Scoreboard 2011 from Digital Agenda for Europe*. Retrieved on May 22, 2011 from http://ec.europa.eu/information_society/digital-agenda/scoreboard/docs/pillar/digitalliteracy.pdf

Ezziane, Z. (2007). Information Technology Literacy: Implications on Teaching and Learning. *Journal of Educational Technology & Society*, *10*(3), 175–191.

Fuchs, C. (2008). *Internet and Society: Social Theory in the Information Age*. New York: Routledge.

Gilster, P. (1997). *Digital literacy*. New York, NY: John Wiley & Sons, Inc.

Hadjerrouit, S. (2010). A Theoretical Framework to Foster Digital Literacy: The Case of Digital Learning Resources. *International Federation for Information Processing* (*IFIP). AICT*, *324*, 144–154.

Hargittai, E. (2005). Survey measures of web-oriented digital literacy. *Social Science Computer Review*, *23*(3), 371–379. doi:10.1177/0894439305275911

Hick, S. (2006). Technology, Social Inclusion and Poverty: An Exploratory Investigation of a Community Technology Center. *Journal of Technology in Human Services*, *24*(1), 53–67. doi:10.1300/J017v24n01_04

Hobbs, R. (2010). Digital and media literacy: A plan of action. *The Aspen Institute and the John S. and James L. Knight Foundation*, Washington. D.C. Retrieved on December 16, 2010 from http://www.knightcomm.org/wp-content/uploads/2010/12/Digital_and_Media_Literacy_A_Plan_of_Action.pdf

Hohlfeld, T., Ritzhaupt, A., Barron, A., & Kemker, K. (2008). Examining the digital divide in K-12 public schools: Four year trends for supporting ICT literacy in Florida. *Computers & Education*, *51*, 1648–1663. doi:10.1016/j.compedu.2008.04.002

Ilomäki, L., Kantosalo, A., & Lakkala, M. (2011). What is digital competence? *LINKED project*. Retrieved on May 21 2012 from http://linked.eun.org/c/document_library/get_file?p_l_id=16319&folderId=22089&name=DLFE-711.pdf

Jones-Kavalier, B., & Flannigan, S. (2008). Connecting the digital dots: literacy of the 21st century. *Teacher Librarian*, *35*(3), 13–16.

Junge, K., & Hadjivassiliou, K. (2007). What are the EU and member states doing to address digital literacy? *eLearning Papers, 6*, 1-14. ISSN 1887-1542. Retrieved on June 2, 2010 from www.elearningeuropa.info/files/media/media14196.pdf

Kahne, J., Lee, N., & Feezell, J. (2012). Digital media literacy education and online civic and political participation. *International Journal of Communication*, *6*, 1–24.

Macleod, H. (2005). What role can educational multimedia play in narrowing the digital divide? *International Journal of Education and Development using Information and Communication Technology (IJEDICT), 1*(4), 42-53.

Morse, T. (2004). Ensuring equality of educational opportunity in the digital age. *Education and Urban Society*, *36*(3), 266–279. doi:10.1177/0013124504264103

Nawaz, A., & Kundi, G. (2010). Digital literacy: An analysis of the contemporary paradigms. *Journal of Science and Technology Education Research*, *1*(2), 19–29.

Norris, P. (2001). *Digital Divide*. New York: Cambridge University Press. doi:10.1017/CBO9781139164887

Orrick, R. (2011). Envisioning an Internet Center for Homeless Individuals: One Group's Quest to Reduce the Digital Divide. *A report of Open Access Connections* by Communiversity at the University of Minnesota's Center for Urban and Regional Affairs (CURA). Retrieved on May 13, 2011 from http://openaccessconnections.org/wp-content/uploads/2011/06/Envisioning-an-Internet-Center-for-Homeless-Individuals.pdf

Potter, J. (2010). The State of Media Literacy. *Journal of Broadcasting & Electronic Media*, *54*(4), 675–696. doi:10.1080/08838151.2011.521462

Rogers, E. (2003). *Diffusion of Innovations*. New York, NY: Free Press.

Seale, J. (2009). Digital Inclusion BETA: A Research Briefing. *The Teaching and Learning Research Programme (TLRP)* (pp. 1-52). Retrieved on December 12, 2011 from http://tel.ioe.ac.uk/inclusion/digital-inclusion-research-briefing/

Selwyn, N. (2006). Digital division or digital decision? A study of non-users and low-users of Computers. *Poetics: Journal of Empirical Research in Culture. Medical Art*, *34*(4-5), 273–292.

Selwyn, N., & Facer, K. (2007). Beyond the Digital Divide: Rethinking digital inclusion for the 21st Century. *Bristol: FutureLab*. Retrieved on July 17, 2012 from http://www.futurelab.org.uk/resources/documents/opening_education/Digital_Divide.pdf

Selwyn, N., Gorard, S., & Williams, S. (2001). Digital divide or digital opportunity: The role of technology in overcoming social exclusion in the U.S. Education. *Educational Policy*, *15*, 258–277. doi:10.1177/0895904801015002002

van Deursen, A., van Dijk, J., & Peters, O. (2011). Rethinking Internet skills: The contribution of gender, age, education, Internet experience, and hours online to medium- and content-related Internet skills. *Poetics*, *39*, 125–144. doi:10.1016/j.poetic.2011.02.001

van Dijk, J. (2006). Digital divide: Research, achievements and shortcomings. *Poetics*, *34*, 221–235. doi:10.1016/j.poetic.2006.05.004

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

Warschauer, M., Knobel, M., & Stone, L. (2004). Technology and equity in schooling: deconstructing the digital divide. *Educational Policy*, *18*(4), 562–588. doi:10.1177/0895904804266469

Woelfer, J., & Hendry, D. (2010). Homeless Young People's Experiences with Information Systems: Life and Work in a Community Technology Center. In *Proceedings of the 28th Annual SIGCHI Conference on Human Factors in Computing Systems (ACM CHI '10)* (pp. 1291-1300). Retrieved from http://dl.acm.org/citation.cfm?doid=1753326.1753520

Zickuhr, K. (2013). Who's not online and why. *Pew Research Center*. Retrieved January 4, 2014 from http://www.pewInternet.org/2013/09/25/whos-not-online-and-why/

ADDITIONAL READING

Eshet-Alkalai, Y. (2004). Digital literacy: A conceptual framework for survival skills in thedigital era. *Journal of Educational Multimedia and Hypermedia*, *13*(1), 93–106.

Hargittai, E. (2009). An update on survey measures of web-oriented digital literacy. *Social Science Computer Review*, *20*(10), 1–8.

Katz, I. (2005). Beyond Technical Competence: Literacy in Information and Communication Technology. *Educational Technology*, *45*(6), 44–47.

Katz, J., & Rice, R. (2002). *Social Consequences of Internet Use: Access, Involvement, and Interaction*. Cambridge, MA: MIT Press.

Livingstone, S., & Helsper, E. (2007). Gradations in digital inclusion: children, young people and the digital divide. *New Media & Society*, *9*(4), 671–696. doi:10.1177/1461444807080335

Martens, H. (2010). Evaluating media literacy education: Concepts, theories and future directions. *Journal of Media Literacy Education*, *2*(1), 1–22.

Martin, A. (2006). Literacies for the Digital Age. In A. Martin, & D. Madigan (Eds.), *Digital Literacies for Learning* (pp. 3–25). London: Facet Publications.

KEY TERMS AND DEFINITIONS

Digital Divide: The disparity between those who have access to computers and the Internet and those who do not have.

Digital Inclusion: An equal digital opportunity for access to and use of ICTs and benefits from the use of ICTs.

Digital Literacy: The necessary digital skills and knowledge in use of ICTs.

Digital Literacy Education: The education to develop the learners' knowledge and skill construction process and use of ICTs.

Digital Literacy Gap: The disparity in the digital literacy levels.

ICTs: Information and communication technologies such as computers and the Internet.