

# New Perspectives In Digital Literacy Readiness

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**Abstract:** The evolution of Information and Communication Technologies (ICT) has generated associated terms such as e-readiness, e-government, digital literacy, and digital divide. These terms are inter-related in one way or the other. Numerous services have also been created for the sake of convenience and easy access to information submission and retrieval. Digital literacy has now become an integral part of our lives and it is deeply embedded in our daily lifestyle. By the end of 2013 it was expected that broadband subscriptions would rise beyond 2 billion globally. The governments and corporates have demonstrated greater interest in taking advantage of this unique and state of the art technology to tap the potential both politically and economically. The governments are busy formulating strategies and policies and heavily investing in building ICT infrastructures in order to electronically reach out to the citizens to the last mile for better and effective governance. This will also fulfill its objective to address socio-economic issues such as education, governance, citizenship participation, employment, health, food security amongst others. The corporates on the other hand are concentrating on formulating sales and marketing strategies to achieve competitive advantage by offering their products and services to the last mile. ICT has opened up windows of opportunities for almost every sector. Efforts are on to bridge the digital and technological divide within and between countries. In this paper, a brief focus is on the digital literacy levels in developed, developing, and least developed nations.

**Keywords:** Digital literacy, Digital Divide, Digital Inclusion, ICT, Telecommunications Policy, Social Policy, Social Inclusion, Digital Rights, Digital Equality.

## INTRODUCTION

Digital literacy can be thought of an ability to use hardware and other digital tools to effectively and successfully accomplish tasks and communicate. Today we are using mobile devices and computers to communicate and accomplish tasks using state of the art technological tools. In other words it is a combination of foundation knowledge, contemporary skills, and critical thinking ability (Bobst). Nevertheless, in this digital era the new generation is completely overwhelmed by the latest technological advances. Alternatively, we can say that today's children are "growing up digital." Their view of the world is very different from that of adults, thanks to unprecedented access to information, people, and ideas across highly interactive media (Burkhardt, et al., 2003). (Rushkoff, 1999) *Playing the Future* agrees: "Our children...are the latest model of human being. Looking at the world of children is not looking backward at our own past—it's looking ahead. They are our evolutionary future" (p. 4). This means children and teens are the fastest growing users of the internet which directly points out the level of digital literacy these young users. The point to ponder here is what kind of information they are receiving from online whether it is having positive effects on their development skills and they fully realize the potential of this technology. The explosive growth in use of digital technologies for learning has left subject disciplines, government agencies and many practitioners with a problem. First, what do they call these new skills that are evidently required to function adequately in today's society? Second, how can these new skills be taught? And third, who is best placed to deliver these skills? (Belshaw, 2012). Sahay identifies four dimensions of computer literacy (Sahay, 2004):

1. ICTs as an Object: Learning about the technology itself. Courses are offered to get knowledge and develop skills about different tools. This prepares students for the use of ICTs in education, future occupation and social life.
2. Assisting tool: ICT is used as a tool for learning, for example, preparing lectures or assignments, collecting data and documentation, communicating and conducting research. ICTs are applied independently from the subject matter.
3. Medium for teaching and learning: This refers to ICT as a tool for teaching and learning itself, the medium through which teachers can teach and learners can

learn. Technology based instructional delivery appears in many different forms, such as drill and practice exercises, in simulations and educational networks.

4. ICTs for education management: The most common and wider application of ICTs is in the organizational and logistic functions of the higher education institutions in the form of transaction processing systems (TPS) and management information systems (MIS).

## Impact of the Digital Divide, Digital Age Learning, and Digital Age Economy

In the 1990s, the digital divide was characterized as a gap in technology access that translated into inequities in educational, economic, social, and civic opportunities among sectors of the population. Since then, education leaders have come to realize that access is simply the first step. Equally important are robust home access and the readiness of individuals to use technology, communication networks, and information efficiently, effectively, and productively (Burkhardt, et al., 2003). (Dobson & Willinsky, 2009) Noted the existence of a digital divide based on factors such gender, geography (developed vs. developing world), and income. The ICDC (2010) suggested the existence of another disparity known as the digital literacy divide, where "some groups are falling behind in their [digital literacy] skills and have less access to new technology" (p. 6). This divide could lead a digitally illiterate worker to be "condemned to ever-shrinking choices of employment" (Information and Communications Technology Council, 2010, p. 6). Not only would this situation have a negative impact on the worker, but the economy would also suffer as Canada will likely face a shortage of skilled workers due to the impending mass retirement of baby boomers (Information and Communications Technology Council, 2010). So how does Canada position itself to ensure it has digitally literate workers? Researchers report a wide variety of factors which favor the increasing gap, such as, among others, low income and other financial limitations, lower-quality or high-priced connections, low level of education, lack of digital literacy, poor technical assistance, and limited access to quality ICT content. Once of the key elements in developing e-governance as a defining factor in bridging the digital divide is promoting ICT skills and digital literacy in a non-discriminative

manner. In order to gain a sustainable society, Governments and other concerned stakeholders should concentrate on ensuring equal opportunities for the young and future generations. ICT is a vital component of that future, and bridging the digital divide should become a world priority. The provision of suitable e-services and the promotion of digital literacy should become a security matter and a top priority for Governments, in order to ensure their country or region a place in the future knowledge based society (UN Chronicle, 2011). At the G-8 Kyushu-Okinawa Summit in July 2000, the industrialized nations acknowledged the advancement of the private sector in information technology (IT) and committed the organization to the Global Digital Divide Initiative of the World Economic Forum Task Force. The Task Force outlined nine initiatives and a set of concrete action plans for implementation, which may achieve e-government readiness in developing countries (Brown, 2002). With children's home access to the Internet increasing, with life and school tasks becoming more and more Internet-dependent, and with quality content requiring higher and higher bandwidth, low-income students are at a potential disadvantage. This disparity is increasing the pressure on schools to provide robust Internet access for all children (Burkhardt, et al., 2003). According to the U.S. Department of Commerce study, *Falling Through the Net* (National Telecommunications and Information Administration, 1999), the digital divide also represents differences in the capacity to use technology tools efficiently and effectively. True equity requires high levels of technology proficiency to ensure broader, more meaningful, and increasingly innovative uses of technology by all segments of the population. In turn, these heightened levels of technology proficiency—so critical in the Digital Age—require higher levels of 21st century education. In *Digital Transformation*, the International Information and Communication Technologies (ICT) Literacy Panel (2002), argues that our conception of the digital divide must be expanded: "A continued focus on building infrastructure should be complimented by an effort to identify those without an ability to manage, integrate, evaluate, and create information in a traditional sense and to provide them with the necessary tools to acquire these skills" (p. 1). Without these skills as a foundation, "all the hardware and access in the world will not...decrease the existing gaps currently defined by the digital divide" (Gonzalez, 2002). Experts at the U.S. Department of Labor stated it best: "We are living in a new economy—powered by technology, fueled by information, and driven by knowledge" (Secretary's Commission on Achieving Necessary Skills (SCAN), 1991). Because of this, they assert, "The influence of technology will go beyond new equipment and faster communications, as work and skills will be redefined and reorganized" (p. 1). Given the rapid diffusion of technology during the past 30 years, many analysts have also considered technological change to be a major factor in determining wages (Mishel, Bernstein, & Boushey, 2003). Some studies estimate that, on average, IT jobs pay 85 percent more than other jobs (Pociask, 2002). This implies that literacy does play a vital role determining the socio-economic conditions of an individual and the community in the larger scale in today's information based economy. According to *Technically Speaking*, a report by the National Academy of Engineering and the National Research Council, "Technologically literate workers are more likely than those lacking such literacy to have a broad range of knowledge and abilities, such as the critical thinking skills identified by the

Secretary's Commission on Achieving Necessary Skills (SCANS)" (Pearson & Young, 2002). At almost any opportunity, three-, four-, and five-year-old children will spontaneously engage in emergent literacy activities. In today's world they have multiple opportunities to observe, explore, play with, and learn from digital media—television, DVDs, MP3s, Touch/iPhones, computers, video games, cell phones, smart toys, and the like (Blanchard & Moore, 2010), (Cricher, 2008), (K & Livingstone, 2008), (Hasebrink, Livingstone, Haddon, & Olafsson, 2009) (Linebarger & Piotrowski, 2009). Rapid globalization, technological advances and invention, societal changes have also caused a change in students' knowledge and learning and behavioral aspects. Over the last decade, there were tremendous advances in the science of learning, made possible by the convergence of research in the cognitive sciences, neuroscience, human development, and technology. As a result, we know more today about how people think and learn (Bransford, Brown, & Cockings (Eds.), 1999). Technology influences learning in three significant ways. (Burkhardt, et al., 2003) A synthesis of recent research and national skill sets shows that technology can be a driver of change, a bridge to academic excellence, and a platform for informed decision making and accountability: (1).A Driver for Change: The 21st Century Skills, (2).A Bridge to High Academic Achievement, (3).A Platform for Informed Decision Making and Accountability. The *enGauge* 21st Century Skills conducted a two year study identified four skill clusters to represent the fresh, serious, new perspective required in light of recent historical events, globalization, and the idiosyncrasies of the Digital Age. These four skill clusters, when considered within the context of rigorous academic standards, are intended to provide the public, business and industry, and educators with a common understanding of—and language for discussing—what is needed by students, citizens, and workers in the Digital Age (Burkhardt, et al., 2003). The four skills are (1). Digital-Age Literacy, (2). Inventive Thinking, (3). Effective Communication and (4). High Productivity. Of these four skills, the digital-age literacy is the most predominant skills needed to negotiate the complexities of digital lifestyle. (Belshaw, 2012) Singapore has a history of investment in ICT within education since the end of the last century with English as one of their official languages. As an Asian country they provide a different perspective to that of the UK. Norway is seen internationally as a pioneer in the field of 'digital literacy' having built elements of it into the foundation of their school curricula. The European Union funds many initiatives including those relating to new literacies. These are referenced in UK and Norwegian literature and demonstrate some of the different ways in which new literacies are considered within Europe as a whole. Finally, the USA and Australia are considered as different contexts within which New Literacies are manifested in the English-speaking world.

### **A Review of Digital Literacy Initiatives and Awareness**

In the present technology based digital learning environment people are left with no other option but to catch up with the rapidly changing digital world. It would be easier to say "literate or educated is weighed in terms of digital literacy". Digital literacy is deemed necessary for "mindful learning in the information society (Aviram & Eshet, 2006). Jeffrey Miller argues that "Digital Literacy: Essential for College and Career Readiness". Digital literacy would help students take full advantage of the digital learning environment. Students will

also be able to utilize technology to enhance self-management techniques or compensate for self-management deficiencies. This dimension alone may have the greatest impact on students' futures due to the long-term implications of personal efficiency and effectiveness on college and career success. Lastly, digital literacy would provide students with the ability to learn more about post-secondary programs, participate in opportunities to experience classrooms and other programs online, and then to make informed academic choices. So, digital literacy is a true essential for college and career readiness. (Miller, 2013). In an ongoing effort to better prepare educators and their students for the new computer-based Common Core assessments, Learning.com announces EasyTech for PARCC/Smarter Balanced. "PARCC and Smarter Balanced are right around the corner, and we know that digital literacy skills are crucial to student assessment success," said Keith Oelrich, CEO of Learning.com. "EasyTech for PARCC/Smarter Balanced is designed specifically to support the implementation efforts of districts and schools eager to ensure their students have the 21st century skills necessary to succeed on the tests." EasyTech is a complete digital literacy curriculum that not only covers technology skills, but goes above and beyond by enabling educators to integrate those skills into core subjects to better prepare students for the future. Fully interactive and standards-aligned, EasyTech supports teachers and equips students with the skills they need to grow, compete and succeed in a global tech-based economy (Learning.com, 2012). In efforts to keep abreast with rapid technological advancements in the present digital era, (District Administration Custom Publishing Group, 2012) Ellen Pitrelli, Director of Technology, Longwood Central (N.Y.) School District, stated "Our administrators, educators, and faculty are taking intense steps to ensure all of our students are digitally literate. Since our district is diverse socioeconomically, it has certainly been a challenge. All students must take a computer literacy assessment that will be reported to the state for federal reporting." The New York State Department of Education mandates that all students must be "technology literate" by the eighth grade. Its definition of technology literate includes:

- Having an understanding of the concepts behind computing equipment, network connectivity, and application software.
- Being able to responsibly use the appropriate technology to access, synthesize, and evaluate information to increase learning in all subject areas.
- The ability to acquire new knowledge for on-going and lifelong learning in the 21st century.

Teachers are also mandated to meet technology competency standards that ensure their ability to use tools effectively in supporting student achievement. To begin to improve our students' computer literacy, I turned to the state Department of Education website. Learning.com was listed as a method of measuring and reporting student growth in technology literacy (District Administration Custom Publishing Group, 2012). Students, teachers and employees define computer literacy differently (Johnson, Bartholomew, & Miller, 2007), however, common people acquire their 'technology-literacy' either formally through formal courses or informally at home, from friends or by themselves (Ezziane, 2007). With today's technological society, basic computer literacy is emphasized in every institution (Ezziane, 2007). Digital literacy is a

combination of technical procedural, cognitive and emotional-social skills, for example, using a computer involves procedural skills (file-management), cognitive skills (intuitively reading the visual messages in graphic user interfaces) (Aviram & Eshet, 2006). Microsoft has been very proactive in promoting digital literacy. Its technological solutions are being used by governments and organizations to leverage upon increased access to computing skills. From schools to workforce development centers to community technology learning centers, Microsoft Digital Literacy is helping individuals develop new social and economic opportunities for themselves, their families, and their communities (Microsoft, 2014). In the twenty-first century knowledge economy, access to essential technology and computing skills is an important predictor of life opportunities. This white paper explores current technology drivers—including global Internet access, Web 2.0 technologies, and ubiquitous computing—and how the essential computing skills curriculum offered by Microsoft Digital Literacy has affected individuals in different geographies and socioeconomic circumstances all over the world (Evans, 2009). The Gulf Region's first ever DigiGirlz Day introduced more than 200 high school girls to technology career opportunities in hopes of reducing the UAE gender gap in information technology (IT). The girls participated in technology workshops and panels, met with Microsoft employees, learned about new technologies, and had the opportunity to take the Microsoft Digital Literacy Certificate Test on site. Dr. Zaki Khoury, Education and Citizenship Lead, Microsoft Gulf quoted "DigiGirlz is an effort to show high school girls what the technology industry is all about, what careers are available to them, and to let them see how exciting it is to create something that can truly impact a large number of people." (Microsoft, 2014). In the last decade, using computers to teach traditional classroom topics has revolutionized the teaching profession. Today, an increasing number of vocational fields are also starting to benefit. In Sacramento, California, a program is helping veteran trainers in vocational fields like law enforcement and fire science bring technology to their non-traditional students (Microsoft, 2014). The Women in Technology (WIT) program in the Middle East and North Africa empowers women by teaching essential computing and career skills to thousands of women in nine countries. Training is delivered through unique partner organizations in each participating country to build a sustainable and scalable program that is tailored to the needs of women in the particular country. The Microsoft Digital Literacy curriculum provides the essential computer skills foundation that participants need to begin their first steps towards a career in the twenty-first century knowledge economy (Microsoft, 2014). Zach Blois referred to being able to successfully and productively utilize digital technology is becoming an increasingly important skill in today's workplace. He argued, because of this increase, teaching and encouraging digital literacy within your schools and classrooms is an extremely important component of helping students develop college and career readiness. He suggested five effective methods that can help educators to enhance student digital literacy inside and outside of the classroom via educational technology and blended learning environments. (1). Explain what digital literacy actually means to your students. (2). Model proper online skills to your students. (3). Make use of student devices during lessons. (4). Assign homework and activities that require the internet and online

resources. (5). Create a virtual classroom experience (Blois, 2013). The Committee for Democracy in Information Technology (CDI) has set up 336 schools throughout Brazil since 1995. The organization's focus is not primarily centered on technology skill acquisition, but rather using computer skills as a tool for transforming lives and communities (Hart, 2001). Their methodology is based on projects through which students learn to use software. In one such project, students create a community newspaper dealing with local issues — the community's problems and dreams. While they are working, the students learn to use word processing. A similar project maps out the institutions and community organizations that provide services, such as health clinics, schools, and NGOs. The students then create community maps, thus learning to use data banks and database software. In a recent interview, Rodrigo Baggio, the founder of CDI, described his belief that technology literacy should be a primary driver for economic development. The Republic of Chile also has made addressing computer literacy a significant national priority. Like the U.S. E-Rate program, Chile has begun an ambitious effort to invest \$100 million in a computer and social network called Enlaces (a Spanish word meaning "links"), enabling thousands of schools to connect to the Internet. However, Enlaces goes even further beyond ensuring access. The project provides extensive training to help teachers integrate technology into the school curriculum and design collaborative learning projects that involve children all over the world. The project also funds on-line support, current classroom materials, and practical tools for keeping track of attendance and automating other administration functions. Most important, it brings together teachers and students from across the country into a unified — and unifying — learning community, helping teachers and students share their experiences in discussion groups and speeding reforms to some of the most isolated Andean communities. According to early program evaluations, Enlaces has begun to achieve impressive outcomes, including increases in cognitive development, reduction in dropout rates, and enhanced job prospects. "It is clear that Enlaces's widespread impact is a direct, if not inevitable, result of big thinking at a national level" (Morino Institute, 2001) (International ICT Literacy Panel, 2007). (Ghosh & Das, 2006) Former president of India, A.P.J. Abul Kalam introduced PURA (Providing Urban amenities in Rural Areas) that describes coherent knowledge and resources distribution across the country. The PURA will deliver three types of connectivity: physical connectivity by providing roads in rural areas, electronic connectivity by providing reliable communication network and knowledge connectivity by establishing more professional institutions and vocational training centres. A report produced by McKinsey & Company (Gnanasambandam, et al., 2012) offers seven key findings concerning the impact of and outlook for the Internet in India. (1). India's base of about 120 million Internet users is currently the third-largest in the world. (2). India is likely to have the second-largest user base in the world, and the largest in terms of incremental growth, with 330 million to 370 million Internet users in 2015. (3). India has the potential to double its economic contribution from the Internet in the next three years, from 1.6 percent of GDP at present to 2.8 to 3.3 percent by 2015. (4). The impact of the Internet in India is constrained by current gaps and obstacles in the Internet ecosystem. (5). Although the Internet ecosystem is becoming more vibrant, the benefits have been relatively concentrated. (6). India can

achieve broad-based Internet impact by aiming for the digital inclusion of nearly 40 percent of its population, to reach a user base of 500 million by 2015, rather than the likely target of 330 million to 370 million. (7). Concerted actions by policy makers and businesses in five areas can help India achieve an inclusive Internet transformation. (Gnanasambandam, et al., 2012) The impact of the Internet in India is constrained by obstacles and gaps in the Internet ecosystem, compared with many peer countries. The exceptions are human capital, where India has a large pool of technically trained workers, and the reasonably well-developed access to finance. On most other dimensions, India's Internet infrastructure and e-engagement levels are limited, and its Internet foundations have significant scope to improve. India's low levels of user adoption and engagement (ranked 49 out of 57 countries in Internet user engagement and accessibility) are due to the following obstacles. (1). Limited availability of Internet infrastructure. (2). High cost of access and usage. (3). Lack of awareness and low digital literacy. (4). Narrow range of applications and services. (Gnanasambandam, et al., 2012) The report further recommends to Enable large-scale digital literacy to promote user engagement. Lack of education about using the Internet and near absence of local language support in devices, applications and services is holding back the increase in usage. This shortfall becomes more acute as less educated users from rural areas gain access to the Internet. Hungary is an example of affordability being an insufficient stimulus to usage: though over 90 percent of the population can afford broadband Internet, only about half actually use it on account of the limited availability of local digital content, and low digital literacy. Sri Lanka's Ministry of Education is promoting digital literacy through the establishment of self-sustaining computer learning centers that provide training and Internet access after school hours. A cadre of "para-technicians" could be created, to act as intermediaries between the Internet on the one hand, and novice users on the other. As more rural and semi-urban users in India connect to the Internet, adoption could be accelerated by developing local language content, with image-based user interfaces and less textual content. Examples might include an India-specific mobile operating system or a simplified weather information application for farmers. At this point in the 21st century, most young children in developed nations live in media-saturated homes, schools, and communities (Burkhardt, et al., 2003), (Alexander, 2009), (Byron, 2008), (James & Pollard, 2010), (Kline, 2004), (Pew Research Center, 2009), (Roberts & Foehr, 2008), (Schuler, 2009), (Vanderwater & Lee, 2009). Young children are not only immersed in a sea of digital media—up to two hours per day—they are also using it. Many have computers and can access age-appropriate web sites (e.g., Webkinz Jr., JumpStart World, MyNoggin). Several computers designed for preschoolers are currently available, including PeeWeePC, 2goE10, Disney Netpal by ASUS, Intel Classmate (see Appendix E), and OLPC's XO, offering USB ports, wireless capacities, and fully functional operating systems (Burkhardt, et al., 2003). Clearly, many young children are developing digital media fluency. (Glaubke, 2009), in a 2007 review of the literature on the effects of interactive media on young children, reported that 64 percent of three- to five-year-old children can use a mouse to point and click, 56 percent have used a computer by themselves, and 37 percent can turn the computer on by themselves. In addition, most children have acquired these skills by three and one-half years

of age (Rideout, Vanderwater, & Wartella, 2003), (Calvert, Rideout, Woodard, Barr, & Strouse, 2005). This early proficiency with media has prompted (Prensky, 2006) to label our youngest learners “digital natives” and the rest of us “digital immigrants” (Burkhardt, et al., 2003). While children in developing and least-developed nations may not be immersed in digital media to the same extent as their counterparts in developed nations, their digital learning opportunities are nonetheless steadily increasing (United Nations, 2008). From the one-rupee video game rooms in the Dharavi slums of Mumbai, to the cybercafes of Condega in the mountains of rural Nicaragua, to the Save the Children/CESVI Internet connections in the École Medina Gounass shantytown of Dakar, to the ever-present cell phones in the villa miserias of Buenos Aires or favelas of Rio de Janeiro, digital media are widely present in the emergent literacy lives of millions of young children (Burkhardt, et al., 2003). However, the impact of digital media is almost non-existent in the least developed nation (Rideout, Vanderwater, & Wartella, 2003). Since cultural and language norms in many developing and least-developed nations differ markedly from Western norms, it is possible that digital media may affect emergent literacy skills in these nations in ways that cannot be foreseen (Burkhardt, et al., 2003). Language and culture may not always be the major influences on how digital media affects young children. Many families around the world face enormous day-to-day challenges, such as basic safety, nutrition and health, attitudes toward formal education, and even the availability of formal schooling opportunities (UNICEF, 2009). However, even in the face of such challenges, it appears that the use of digital media is likely to become more widespread in the lives of these families and their children (Burkhardt, et al., 2003). Several organizations, including non-profits, foundations, university centers, corporations, and non-governmental entities (NGOs), have taken an interest in digital tools and media with respect to young children in developed nations, and some are beginning to show an interest in their impact on children in developing and least-developed nations. These organizations include the Henry J. Kaiser Family Foundation; Joan Ganz Cooney Center at Sesame Workshop; John D. and Catherine T. MacArthur Foundation; Esmée Fairbairn Foundation; International Clearinghouse on Children, Youth and Media; the Pearson Foundation; and the BBC World Service Trust (Burkhardt, et al., 2003). Young children immersed in digital media opportunities will develop some degree of digital literacy, that is, the ability to use digital media for speaking, listening, reading, and writing purposes. But digital literacy includes not only traditional emergent literacy skills like reading and writing, but also the psycho-motor skills needed for keyboarding and cell phone use and the problem-solving skills needed for navigating Google sites and using iPhone apps. We can expect that, as literacy skills develop, so will skills in digital literacy, especially as young children become more comfortable using digital media as tools (Burkhardt, et al., 2003). As (Resnick, 2002) suggested, “When you learn to read and write, you are in a better position to learn many other things. So too with digital fluency” (p. 33). (Cavallo, 2000) of the M.I.T. Future of Learning group has noted, “The idea of building technological fluency draws on the image of being fluent in a language. When one is fluent in a natural language, one can think, express, communicate, imagine and create with that language. In the same way, we like to develop fluency through the construction of, and with

technology as a means of, personal and group expression” (p. 771). Although there is no empirical research supporting the notion that literacy and digital literacy skills develop in tandem, previous research with computers has documented positive relationships between computer use and overall learning gains (Norris, Sulliva, Poirot, & Soloway, 2003). (Deborah, 2012) The need for a digitally literate population is critical if Canada is to successfully compete in the world economy, especially given that the service sector comprises 70% of Canada’s gross domestic product (GDP) and employs 76% of the Canadian population (Chinien & Boutin, 2011). The challenge facing educators is how to ensure today’s students are prepared for the 21st century workplace. Digital literacy is very important from Canadian economic viewpoint (Deborah, 2012). (Bawden, 2001) Noted that “as digital technology becomes ubiquitous, workers will increasingly need an appropriate set of digital skills to access and process information using digital systems and tools” (as cited in (Chinien & Boutin, 2011) p. 14). Due to globalization, Canada now competes with other countries and “while the production of hard goods is important, national prosperity heavily depends on increasing productivity in the service sector” (Information and Communications Technology Council., 2010). Unlike past trading, however, where the focus was on raw materials, today’s trade takes place in a knowledge economy without borders. As noted by the Information and Communications Technology Council, (ICTC), (2010), digital literacy “is the fundamental requirement for effective participation in the world’s economy” (p. 1). (Deborah, 2012) Digitally literate individuals are viewed as being more flexible and adaptable (Ng, 2012), as well as capable of working more efficiently (Information and Communications Technology Council, 2010). The ICTC (2010) concluded that digital literacy is needed “to retain flexibility and mobility of career and job openings” (p. 6). The ICTC (2010) also identified that digitally literate individuals can positively impact productivity, innovation and research and development in a number of ways, such as “speed[ing] up the responses of companies to commercial opportunities, extend[ing] academic research more deeply and quickly, and exchange[ing] best practices with global colleagues” (p. 2) (Deborah, 2012).

## Conclusion

A global movement for digital and media literacy education is developing all over the world (Frau-Meigs & Torrent, 2009) (Conclusion: Imagining the Future). As noted by (Aviram & Eshet, 2006), “the digital era is not going to disappear, and the need for education to respond to the growing digital tide is rapidly increasing” (para. 90). To prepare students for the 21st century workplace, curricula must focus on the acquisition of digital competence by applying skills to real-life situations wherever possible. In addition, teachers should model appropriate technology use during lesson delivery and provide students with opportunities to use technology on a regular basis. A digitally literate workforce is necessary if Canada is to improve its productivity and successfully compete on the world stage (Deborah, 2012). New opportunities are impacting a generation of young children, who are approaching learning and literacy in ways not thought possible in the past, and developmental milestones are changing. As noted by (Rideout, Vanderwater, & Wartella, 2003) and (Vanderwater & Lee, 2009), these changes present a revolutionary phenomenon in child development and must be understood. Until recently, research into these changes has drawn scant

attention, especially regarding children in developing and least-developed nations. But today interest is coming from governments, NGOs, foundations, universities and businesses. (Blanchard & Moore, 2010) However, until more empirical research becomes available, it is only possible to speculate about the effects based mostly on what the research has taught us about television and computer-based learning with older children, adolescents, and adults in developed nations. Factors that may be affected include attention, information processing speed, social collaboration, attitudes, and digital literacy. The media would redefine the human cognitive and learning skills that may lead to the development of literacy skills to meet the needs of digital media.

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