Running Head: Scholarly Essay – New literacy in the Digital Age

Assignment 3:

New literacy in the Digital Age: understanding the dynamics of needed computer and digital competencies in a post-secondary educational setting

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**Introduction**

Technology readiness and digital literacy skills of High School graduates – are they ready for post-secondary education? This essay presents and defends the following thesis statement: students entering post-secondary education could be better prepared in the area of technology readiness as they are lacking certain computer and digital literacy skills. This essay explores this question through a discussion of findings in the literature.

**Background**

Post-secondary institutes invest large sums of money in information technology to support both teaching and administration to meet the needs of students and to enhance student technology knowledge and skills to develop the graduates that employers demand (Lewis, Coursol and Khan, 2001). Employers expect graduates to have current technology knowledge and skills appropriate to the discipline to support them and to provide growth in the workplace (Wilkinson, 2006). For example, a survey of 1500 corporate recruiters in the US found that computer literacy was ranked second behind communication as the most desirable skill of business graduates (Moody, Stewart and Bolt-Lee, 2002). In addition, the workplace expects workers to have proficient computer skills as they do not have the capacity through their overtaxed information technology departments to provide training in this area (Dickerson, 2004). However, expectations around information technology use and the associated required skills are constantly changing as technology rapidly evolves.

Post-secondary institutes are the middle stakeholder in students’ journeys from high school to the educated workforce. Post-secondary institutes struggle to keep up with technology changes, infrastructure upgrades, curriculum refresh and faculty adaptation. Students are also changing in stride with technology changes; the digital natives of today that are moving through post-secondary education, are much different than the digital immigrants of just ten years ago.

There is much debate in the literature about the characteristics and differences of people born within the last 25 years that are sometimes referred to as digital natives (as defined by Prensky), compared to the digital immigrants of previous generations (Prensky, 2001; Bennett and Maton, 2010). Regardless of the debates in the literature, digital natives do not consider computers, e-mail and office productivity software as technology like immigrants do because these technologies have been around for all of their digital lives (Oblinger, 2005; Oblinger and Hawkins, 2005). As technology is something new within a person’s lifetime, the definition of technology is therefore dependent upon ones age. For an 18 year old leaving high school and entering post-secondary education, the iPad is technology, the excel spreadsheet is just a tool and social networking tools are probably somewhere in-between as they became main stream throughout their youth. Post-secondary institutes are just starting to experiment with iPads to figure out how they can be used in education and they are making uses of social networking technology especially for recruiting and retaining students. Common office productivity tools or technology such as word processors, spreadsheets, e-mail and presentation software are common tools used throughout postsecondary education and the workforce.

Associated with the development and use of digital tools and technology is the development of specialized literacies that are growing and changing rapidly as technology changes. Traditionally, literacy referred to reading and writing, and like numeracy, these skills have never been optional to be a fully functional member of society (Jones-Kavalier and Flannigan, 2006). Since the computer revolution, computer and digital literacy have appeared and evolved, and are currently merging into a broader literacy called information literacy. The average computer literacy skills of high school students related to social networking probably far exceeds that of even the youngest post-secondary instructors and professors. However, the everyday and advanced information literacy skills of high school graduates may be weak in many areas and may not prepare students well for academic studies (Bennett and Maton, 2010) or the workforce (Media Awareness Network, 2010). For example Keen (2007) found that students are more interested in using computer technology for social-networking purposes than for education. This gap in student computer and digital literacy skills creates a challenge for post-secondary institutes as they quite often need to include a basic computer course as part of their first semester course load to ensure new students have a common level of basic and intermediate computer and information literacy knowledge and skills before they progress through their programs. These general computer courses often compete with core and specialty program courses and can result in curriculum compromises to meet graduation requirements and employer expectations (Green, 2001). Some institutes are eliminating introductory computer courses with the expectation students will arrive with adequate computer knowledge and skills. This however could be detrimental to incoming students that do not have proficient computer skills (Wallace and Clariana, 2005).

This essay explores the perceived, actual and expected levels of digital and computer literacy levels of high school graduates entering post-secondary education and examines what selected post-secondary programs are doing too enhance student literacy levels so they are prepared for the workforce. This is accomplished through a review of the literature related to information literacy of entry level post-secondary students. The essay draws conclusions and makes recommendations to K-12 administrators and teachers on how changes could be made to enhance their student’s information literacy levels that will in turn aid in the hand off of high school graduates to post-secondary institutions.

**Relevant Literature**

There are several types of technology related literacy discussed in the literature: computer, digital, information and media. Computer literacy deals with the use of computers and related technologies. Digital literacy goes beyond basic computer skills and deals with the use of information with digital technologies (Media Awareness Network, 2010). Information literacy deals with abilities to analyze information to support decision making. Some researchers (as reported by Higntte, e tal, 2009) argue that the concept of computer literacy is dated and that we should focus on information literacy. Media literacy deals with critically analyzing messages that people watch, hear and read.

All of these different literacies are important; however this essay will focus on computer and digital literacy skills as they play a key role that supports workforces competing in the global economy (Finn, 2004). In addition, the Media Awareness Network (2010) reported just 4 months ago that Canada has fallen behind many countries in developing our digital economy. They also state that Canada has not made digital literacy a cornerstone of our digital economy strategy like some of our competitors have such as the UK, Australia, New Zealand and the United States. Until the federal government provides more guidance through a strengthened digital economic strategy, educators will need to work together to strengthen student and graduate computer and digital literacy skills as we hand them off in sequence from elementary school to middle school to high school to post-secondary institutes and finally to the workforce.

Before computer and digital literacy skills can be examined, the skills of students need to be assessed. The Global Digital Literacy Council guides the development of digital literacy standards, supports benchmarks and provides tools for measuring proficiencies of key technologies for education, the workplace and for life (GDLC, 2010). There are several organizations that have developed and implemented standards for assessing technology literacy skills including the International Society for Teaching in Education (ISTE) and the Association to Advance Collegiate Schools of Business (AACSB) (Wilkinson, 2006). The Educational Testing Service (ETS) is a US private, not-for-profit testing and assessment organization that develops and standardized tests used by educational institutes worldwide. Included in their menu of tests are the ICT Literacy Assessment Core and Advanced Levels. These tests were developed to help post-secondary institutes assess the computer and digital literacy skills of incoming students transitioning from high school (Young, 2005). Another assessment tool used to test students’ computer literacy is the Skills Assessment Manager (SAM) available from Thompson Learning and Course Technology. Wallace and Clariana (2005), and McDonald (2004) used the SAM 2000 and SAM XP assessment tools to support their research of computer literacy skills of incoming students to post–secondary Business programs. Csapo (2002) uses the European Computer Driver’s Licence/International Computer Drivers Licence (ECDL/ICDL) tool to assess student computer skills in Microsoft Word tools. Universities quite often define computer literacy as the ability to perform tasks in Microsoft Office (Wilkinson, 2006) and they base student assessments on the use of these tools.

The computer and digital literacy skills of incoming students can be measured two different ways: those perceived by the student or, their actual skills as measured with a standardized test. Young (2005) found that most educators agree that students entering post-secondary education know how to use technology for certain purposes, however not necessarily for purposes that will allow them to be successful in their studies or in the workforce. Similarly, Messineo and Deollos (2005) found that students who are comfortable with their basic computer skills are not necessarily confident with more marketable advanced skills used for data processing and analysis. And finally, Olsen (2000) and Creighton et al (2006) concluded that students entering post-secondary programs project a technology savvy image because they are proficient in certain basic computer skills (word processing, Internet, e-mail). However fewer students are proficient in the data processing and analysis skills gained from actively using spreadsheets, databases and presentation applications.

Several studies have indicated that student perceived computer skills are higher than they really are. Wilkinson (2006) reports that incoming students in a large US Midwestern University, self-reported higher than average computer experiences and computer proficiency skills (Word, Excel, Access and PowerPoint). However, online pre-test examinations using SAM for these same students did not reflect the self-reported proficiencies. Their actual scores used to measure computer proficiency based on the four Microsoft Office applications listed above, were in the 51-59 percent range. The good news is, the scores of these students increased to a range of 66-78 after taking an introductory computer course. Similarly, Wallace and Clarina (2005) found incoming students to a business program in the eastern US achieved only 58-60% on Excel and computer concepts test using both ETS and SAM software. After completing an introductory computer course, their test scores increased to a range of 78-82%. McDonald (2004) found similar results at a south eastern US university where incoming student test scores were low and raised significantly after taking computer courses. McDonald concludes that given the computer skills of in-coming students, post-secondary institutes must continue to provide relevant and structured computer instruction in their programs.

There are many other studies in the literature that indicate that post-secondary student computer and literacy skills could be better, including: use of ICT by students is limited in scope (Selwyn, 2009), students do not want to use ICT in education (Lohnes and Kinzer, 2007), students lack a deep knowledge of technologies (Bullen et al, 2008), students have limited in-depth technology application knowledge and problem solving skills (Kvavik, 2005) and, students are not as net-savvy as we have assumed (Lorenzo and Dziuban, 2006).

These results indicate that students coming into post-secondary programs have more to learn about computer literacy then they perceive (Wilkinson, 2006) and it identifies a computer and digital literacy gap that could potentially be addressed before students are handed off from high schools to post-secondary programs. If high schools could lessen this computer literacy gap of their graduates, it would make it easier for post-secondary institutes to enhance their student’s computer literacy skills before they in turn are handed off to the workforce.

Post-secondary institutes also need to be aware of how effective they are in transitioning the lives of their students through the use of technology. Even if students coming into their institutes have good digital and computer literacy skills, they need to make sure these skills are enhanced along the way. Some have reported in the literature about the lack of faculty computer technology skills that hinders student computer skill advancement (Jones-Kavalier and Flannigan, 2006), and others have identified programs that are not well developed resulting in student technology skills that stagnate or regress by graduation. For example, Higntte et al, (2009) completed an information literacy assessment of 600 first and second year college students in the US with the ETS ICT assessment tool. The tool assessed students ability to collect, analyze and utilize information gathered through the use of information technology and found that only 40% of the students passed the exam. They conclude that to be able to go beyond the basic use and manipulation of hardware and software, courses must focus on enhancing the students’ abilities to collect, construct and analyze information that supports decision making; these are the abilities that are the basis for information literacy. This conclusion is also supported by Eisenberg and Johnson, (2002) who believe that computer literacy comes from the use of technology to organize, communicate, conduct research and to problem solve.

Johnson et al, (2006) found that the computer confidence skills of Business Management Majors in a US State College decreased as they moved through the program. They discovered that faculty were not requiring students to apply basic computer tools, except for word processing. The Business School developed a change management plan to support the faculty in upgrading their technology skills and to improve the curriculum so that student assignments included the application of concepts and skills from previous computer classes. This approach is supported by the International Society for Technology in Education (ISTE) that recommended in 2000 that computer use be integrated into content areas (as reported by McCade, 2001).

**Discussion**

Based on a cursory review of the literature, there is much evidence to support the thesis statement that students entering post-secondary education from high school are not adequately prepared in the area of computer and digital literacy. Most of the literature is from the US but at least one Canadian study reviewed (Bullen, 2008), agrees with the overall conclusions and states that students have limited in-depth technology application knowledge and problem solving skills.

Overall the literature indicates that the strongest skill areas of incoming students are with word processing, e-mail, and use of the Internet browsers. Areas of weakness include computer concepts, software applications for presentation (PowerPoint) and data analysis (spreadsheet and database). Being computer savvy especially around how to interpret and use information that students find on the internet and the lack of knowledge around managing their digital footprints was also identified as a weaknesses. Wilkinson (2006) hinted that students are taught computer skills in high school but questions why they do not transfer these skills to post-secondary programs.

Post-secondary institutes address these skill gaps in several ways: require incoming students to write a technology competency exam, include a first semester computer course or assume students have the necessary computer skills to be successful in the program. Based on the incoming student computer literacy test results summarized above, many students would fail or marginally pass indicating they would struggle through their courses that require the use of computer technologies. Wallace and Clariana (2005) state that based on a 60% pass, 64% of the students failed in their study, indicating these students would need to take an introductory computer course to be successful in their program.

Many studies encourage post-secondary administrators of business programs to include a basic computer course early in their programs as it cannot be assumed that incoming students have the necessary skills to be successful in their programs (McDonald, 2004 and Wallace and Clariana, 2005). In 2005, Wallace and Clariana did a quick search on the internet and found nearly 20 Universities in the US require all students take a basic computer skills course. They also found similar requirements for over a dozen US Colleges and over a dozen Universities outside the US.

Post-secondary institutes are therefore addressing weak computer and digital literacy skills of incoming students by including basic computer skills courses in their programs. This may be similar to how they enhance student traditional literacy and numeracy skills by including communications and math courses early in their programs. The difference is, post-secondary institutes set entrance requirements to their programs based on grades of English and Math courses from high school. With these courses and entrance requirements, a known minimum level of competency is known, whereas with computer and digital literacy, there is no standard computer course from high school to base entrance requirements on.

Perhaps this is the rationale for high school administrators and K-12 Education Ministries to start determining how they can include computer and digital literacy at the same level of importance as traditional literacy and numeracy knowledge and skills in their curriculum. This could be accomplished through a basic computer course as a high school graduation requirement or more integration of computer technology into current curricula to raise the level of computer and digital literacy levels at graduation. This in turn should result in students entering post-secondary with standard computer and digital literacy skills and at a higher level than we are currently seeing.

**Conclusions and Recommendations**

Students entering post-secondary directly from high school are technology savoy in certain areas such as some basic computer skills and especially for maintaining their social networks. Many lack computer and digital literacy skills that support an academic, business and career success perspectives. For example their MS office skills in Excel and Access are weak and in skills in Word and PowerPoint could be stronger. Concurrently their digital literacy skills are naïve as they do not understand how to or why they should scrutinize what they use from the Internet.

Based on the demand for increased digital and computer skills of our workforces in support of the development of digital economies, all education stakeholders from Kindergarten to Post-secondary need to work together to ensure graduates are ready for this economy. Post-secondary institutes are responsible for the final knowledge and skill development of graduates before they enter the workforce. They are currently struggling to meet this challenge partially because they do not know the level of computer and digital literacy skills that incoming students have compared to thier traditional literacy and numeracy skills. Curricula changes have been made to address inconsistent and weak computer and digital literacy skills of students so they at least have a minimum literacy level after their first semester. Research has shown that computer and digital literacy skills of first semester students do increase significantly, indicating they have the capacity to learn these skills before leaving high school.

Education Ministries and high school administrators should raise the level of importance of computer and digital literacy to that of traditional literacy and numeracy in their curricula so that graduates have a measurable and higher level of technology literacy. This will help other stakeholders meet the challenges of developing a competent workforce that supports the growing digital economy.

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