INFORMATION LITERACY ON THE GO! ADDING MOBILE TO AN AGE OLD CHALLENGE

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ABSTRACT

Integrating information literacy skills is fundamental to learning in all contexts. The nexus of mobile devices and information literacy lessons to learn these skills is an innovative pedagogy in higher education explored in this Mobile Information Literacy Tool (MIL) project. Currently, the project's second stage of data collection and analysis is underway with Canadian undergraduate students in seven different classes majoring in psychology, social work, English or social development studies. The purpose of this stage is to test the MIL tool and determine the effectiveness of using mobile technology to enhance students' information literacy skills and learning experiences. Pre and post-test measures will generate quantitative and qualitative data where data analysis will indicate a degree of change in frequency of mobile device information literacy access and fluency in digital literacy skills. Our hypothesis was that digital literacy skills increase with the use of the mobile technology information literacy tool. The research project's preliminary successes and experiences with overcoming the barriers to support anytime, anywhere student mobile information literacy training to engage and enhance mobile learner's experiences are discussed. Based on our stage one research findings (Hanbidge Sanderson & Tin 2015), gaps in participants' information literacy knowledge lead us to advocate that information literacy be an explicit part of the core content in classroom curriculum.

KEYWORDS

Information literacy; mLearning; higher education

1. INTRODUCTION

Many university students struggle with information literacy skills in searching for appropriate information and evaluating the validity of sources when completing assignments. It is especially critical that students understand how to conduct research and be self-reliant in the electronic information environment at a time when there is less need to consult directly with a librarian or to physically enter a library. Academic literature has emphasized the value of teaching information literacy skills, and clearly links this to academic and critical thinking skills, as part of a comprehensive university education (Kim & Shumaker 2015; MacPherson 2004; Tumbleson & Burke 2013). With the emergence of new technology, ways to develop information and digital literacy skills in the curriculum that interact with mobile technology offers exciting possibilities (Saunders 2012). The advance of digital technologies offers opportunities to educators to design authentic learning materials directly suited to students' learning needs (Monahan McArdle & Bertolotto 2008).

A collaborative effort between faculty and the Library included the development, design and implementation of the mobile lessons and its applications. Thirteen information literacy mLearning lessons were developed (http://beam.to/renmil) and designed to demonstrate how to locate, evaluate, and use information effectively. The Mobile Information Literacy Tool (MIL) lessons include step-by-step videos, practical tips, links to online resources, and interactive exercises to assist students in writing assignments and research papers. An overview of the development, administration and evaluation of a new MIL tool to enhance information literacy training will be explored with the aim to contribute to the understanding of the innovative practice for academic mLearning.

2. BODY OF PAPER

MLearning involves the use of mobile devices to deliver electronic learning materials with built in learning strategies to allow access to knowledge from anywhere and at any time. MLearning or "education on the go" utilizing mobile devices such as mobile phones and tablets, expands the boundaries of anytime, anywhere learning and will play an important and exciting role in the future of learning in the curriculum (Saunders 2012; Wu et al. 2012). Helping student learners improve their information skills using mobile devices shaped the study's research framework. Information literacy is commonly defined as the ability to locate, to access, evaluate, and use information that cuts across all disciplines, all learning environments, and all levels of education (Association of College & Research Libraries' Information Literacy Competency Standards for Higher Education 2000; Saunders 2012). Project objectives were to develop best strategies from a user perspective, for delivering and accessing information that enhances student information literacy skills through mobile technology.

Overall, research on the educational use of mobile devices is in its early stages and includes limited case studies of different implementations (DaCosta 2010; Schmidt Hanbidge Sanderson & Tin 2015); however, it is anticipated that mLearning will grow quickly in the next few years. Customized mobile learning applications aim to facilitate mobile learner's experiences through the "situated classroom". This type of classroom is an augmented learning environment developed to relate specifically to the learner's needs (Jeng et al. 2010). With the development of a variety of mobile devices that are more powerful, portable and with better Wi-Fi access, this research will serve as a foundation for developing, promoting and evaluating segments of mLearning among students.

Phase 2 of this information literacy study aims to enhance student learning and further testing of learning analytics and the MIL tool. University undergraduate students participated in a mixed method non-experimental research design study to understand the frequency of access to the information literacy tool and the change in fluency of information literacy skills using mobile devices. Study participants completed thirteen online mobile information literacy lessons, pre- and post-tests and a questionnaire. Collaborative efforts between faculty and library staff will provide recommendations to support anytime, anywhere mLearning.

2.1 Literature Review

Mobile learning involves the use of mobile devices to deliver electronic learning materials with built-in learning strategies to allow access from anywhere and at any time (Ally 2005a). Thanks to mobile devices such as mobile phones and tablets, mLearning or education 'on- the-go', expands the boundaries of anytime, anywhere learning and is situated clearly in the future of learning (Keegan 2002; Wu et al. 2012). Educators aim to provide interactive, multimedia content geared to student's learning needs (Clough et al. 2008; Monahan et al. 2008). As it is an emerging field, the potential of mLearning is still untapped and best-practice guidelines for mLearning are still under development. Although using mobile technology for information literacy training is limited, there are a few programs in universities and colleges in the United States, England and Australia that include infusing information literacy and technology into the educational experience of for-credit courses and a certificate is provided upon graduation for completion of the lessons (DaCosta 2010; Kraemer et al. 2007; Salisbury & Ellis 2003; Warnken 2004).

Academic literature emphasized the value of teaching information literacy skills, clearly linked with critical thinking skills, as part of a comprehensive university education (Kim 2013; MacPherson 2004). Many students struggle with information literacy in searching for appropriate information and evaluating the validity of sources. Research on educational mobile learning is a recent development and there have been limited research surveys conducted (Attewell 2005; British Educational Communications Technology Agency 2004; Keegan 2002). Sound critical thinking skills underpin the cluster of information literacy skills which highlight the importance of being able to navigate the wealth of information available to today's university students. The Australian and New Zealand Information Literacy Framework (2004) was developed to identify higher education information literacy competency levels. A study on the integration of information literacy skills in the curriculum in England, the United States and in Canada in selective higher education centers found limited information in the curriculum (DaCosta 2010). Although information literacy

skills were deemed to be important tools for students by teaching faculty, there were limited opportunities in these countries to teach these skills as they were not integrated into the curriculum (DaCosta 2010).

There appears to be no consensus among faculty on when students should learn these skills or if they need to be explicitly taught information literacy in the curriculum (DaCosta 2010). An apparent gap between the information literacy skills that faculty want their students to have and those that they actively support and develop has developed. It is a gap that faculty and librarians from various faculties are best placed to fill as collaborators and bridge builders. To fill this gap in the research, this innovative short-term project will enhance the design and implementation of a mobile digital learning tool project to support and enhance mLearning pedagogy in higher education. This project begins this collaborative, bridge-building process. Another identified challenge is the misperception by some faculty that computer literacy equals information literacy (Salisbury & Ellis 2003). Osmosis does not work for the development of such skills, but rather pedagogical collaborations between faculty and librarians can be encouraged and established to assist in incorporating information literacy into higher education curriculums. This highlights the gap between the level of importance of the skills and embedding them into the curriculum.

Outcomes of this project will have several meaningful and significant contributions to the emerging knowledge in the field of mLearning. To be successful and independent learners for life, students must graduate with the ability to successfully navigate electronic environments. They must understand and use both the information and technology related to their fields of study. With emergence of new technology, ways to interact mobile information literacy education with the curriculum offers exciting possibilities.

2.2 Methodology

One hundred and fifty-three undergraduate arts and humanities students in seven classes in psychology, social work, English, or social development studies in a Canadian university are currently participating in the phase two pilot research study to determine the effectiveness of mobile technology in enhancing students' information literacy skills and learning experience to date. Our study was a mixed-method (quantitative and qualitative) non-experimental approach, including both pre- and post- digital literacy tests and student questionnaires. This project and the survey instruments were approved by the Research Ethics Board at the University of Waterloo, Canada. The final phase of data collection is currently underway. Data analysis will indicate the degree of change in frequency of mobile device information literacy access and fluency in information literacy skills. Our research hypothesis is that information literacy skills will increase relative to the use of the information literacy mLearning.

Statistical analysis of the completed surveys and questionnaires will be done using Survey Monkey`s Analyze tool, excel spreadsheets, and a systematic review of the raw data will be completed through Wordpress (https://wordpress.org/). Opened ended questions will be coded and thematically analyzed while usage of the MIL web app tool was explored through Google Analytics. The data will be analyzed for program improvement, MIL tool enhancement and expansion, and as basic evaluation research in the emerging field of information literacy academic instruction.

2.3 Preliminary Findings

Demographic data collection through the survey tools gathered participant information and preliminary data analysis indicated some trends about their mobile phone use. Almost 50% of students were in a post-degree Bachelor of Social Work program, while 23% of students were in an undergraduate SDS program and the remaining students (about 27%) identified their programs as other arts faculty or humanities programs (psychology, sociology, English or fine arts). The comparison group demographics closely matched with other participant groups and consisted of twenty Bachelor of Social Work students. Most study participants were female (94%) and seventy-nine percent of the participants were between the ages of eighteen and twenty-five (Table 1. Gender & age), while only 2% of participants indicated they were over fifty years of age. Prior to participating in this MIL pilot study, almost 84% of students had not received any type of literacy skills training.

Close to ninety nine percent of participants owned a smartphone and 59% of these participants were Apple iPhone users. This group reported using their phone and other mobile devices (i.e. tablets) on a daily basis. Only eleven percent of this group used a mobile device to search for academic related information

despite daily usage, while twenty seven percent of them made phone calls with their device. Texting was their main use (52%), while 18% browsed the internet and less than 3% of students played games on their smartphones.

Table 1. Gender & age

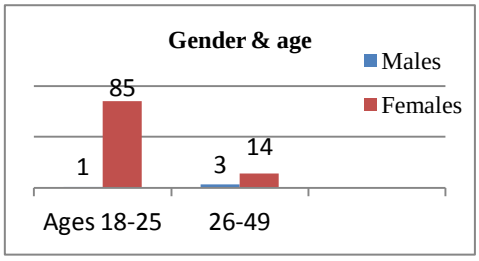
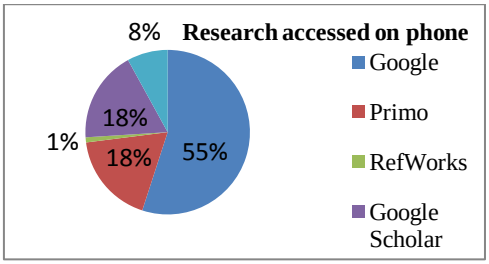


Table 2. Research accessed on phone



Students who accessed academic information or conducted research on their phones (Table 2. Research accessed on phone) significantly preferred using a Google search engine (55%) over other search tools, such as the University of Waterloo research and discovery tool, Primo (18%), other research databases, including Google Scholar (18%), or RefWorks (1%), a web-based citation and bibliography tool.

Preliminary findings in the data indicate that a second year sociology class who completed the MIL study, 15 of the 36 (41.7%) study participants improved their information literacy skills from the beginning of the semester to the end. In a fourth year seminar class in social development studies, 14 of the 22 (63.7%) study participants improved their pre-posttest scores, and enhanced their information literacy skills. Both classes completed a research paper as part of the course final mark.

Several challenges impacted the preliminary results of the study, including limited visual cues in the MIL tool and difficulty opening MIL lesson video links. Multiple technology challenges were indicated by students such as small viewing screens on the smartphones and limited data coverage to access the MIL lessons. One common concern voiced by participants regarding the use of smart phones was the cost of accessing Internet data. Availability of more Wi-Fi capable phones and free Wi-Fi accessible locations should address the issues of the cost of access. Additional issues raised by the participants with regards to MIL training, included: eye strain caused by small mobile screens; difficulty inputting data on small keyboards or that the phone lacked a keyboard altogether; need to use more multimedia, including visually appealing videos and interactive exercises; MIL web app is only optimized for IOS use, thus causing some viewing issues on Android devices (e.g. Drag and Drop exercises only work with touch screen devices); and slow internet.

Study participants identified positive experiences to mLearning, including; access to a new opportunity to learn about information literacy, an appreciation for the visual aspects of the MIL tool, support for mobile phones as superb tools for efficiency, accessibility of the tool (in hand when on-the-go) and the internet (appreciated Wi-Fi access), and the speed with which the lessons could be completed.

3. CONCLUSION

Information literacy is not a standard part of classroom content, but appears to be provided only to those students who actively seek out the information. The question remains, if developing literacy skills is fundamental to learning in many contexts, why is learning information literacy not a dedicated element in the main curriculum? In spite of the increase in mobile applications, our research indicates that there is a need to collect more information and evaluation of mobile information literacy tools to develop a strong underlying evidence base for academic mLearning. Within the MIL lessons, there is need to further develop and enhance the content, videos and interactive tools to potentially support greater positive outcomes. This project has reinforced that both learners and educators need to develop a range of information literacy skills and be provided supportive materials to take full advantage of and make the best use of the emerging technologies.

Inclusion of information literacy in undergraduate curricula often remains an aspiration rather than a fully realized ideal. Outcomes of this project aim to contribute significantly to filling a gap in the research while supporting mLearning pedagogy at the higher education level to promote learning among undergraduate students, the community and beyond.

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