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A Study of Graduate Students' Information Literacy Needs in the Electronic Resource Environment

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By

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ABSTRACT

This study examines the information literacy skills of graduate students at the University of Windsor. The study encompassed a quantitative survey questionnaire administered to 137 graduate students and a qualitative component that involved semi-structured, open-ended focus groups with 17 graduate students. The quantitative component was based on the modified Beile O'Neil Test of Information Literacy for Education (B-TILED), an online survey instrument that measured information-literacy related skills. The survey questions were sorted into seven categories: "demographic information"; "knowledge of library services"; "search strategy"; "knowledge of electronic resources"; "information literacy assessment"; "citation"; and "ethical considerations and copyright." SPSS was used to analyze the online survey data. Statistically significant results were found for B-TILED scores on three independent variables: language spoken at home (for "search strategy," "knowledge of electronic resources," "citation," and "ethical considerations and copyright"); graduate status (for "search strategy" and "citation"); and program of study (for "search strategy" and "citation"). Results for questions related to the library's training session and library services were very low with respect to use and awareness.

Focus group questions focused on information-seeking preference and knowledge of the library's electronic resources and were based on three key terms: "material's format preference"; "Google Scholar usage"; and "awareness of the library troubleshooting services." A text search query through NVivo software generated an overview of graduate students' perspectives. Focus group results showed that participants (a) preferred to use electronic rather than print resources; (b) came to the library to request assistance from the reference librarian, to attend meetings, and/or to use library

facilities; (c) noted problems with the library website's layout, database function, and bookmarks; and (d) preferred to use Google Scholar and other resources rather than the library's website.

This study demonstrates that participating graduate students had only a basic understanding of information literacy skills—significantly less than the level required by the Association of College & Research Libraries. They need more information literacy training, potentially through an information literacy credit course or through intensive one-on-one instruction. Particularly, increasing the collaboration between libraries and faculties to integrate effective library-led information literacy into graduate course instruction would greatly benefit graduate students' research and overall academic success.

DEDICATION

I dedicate this dissertation to my family, my wonderful friends, and many supportive colleagues. I extend special thanks to my husband Yongguo Fan, my daughter Cathy Ye Fan and her husband Shang Wang, and my sister Shuyu Zhao and her husband Zhaojin Cao, whose words of encouragement and push for tenacity were always with me. Their unwavering support has made my entire doctoral journey an enjoyable, life-changing experience.

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LIST OF ABBREVIATIONS

AASL: American Association of School Librarians

ACRL: Association of College Research Libraries

ANOVA: Analysis of Variance

ALA: American Library Association

ALCTS: Association for Library Collections & Technical Services

APA: American Psychological Association

ARL: Association of Research Libraries

B-TILED: Beile Test of Information Literacy for Education

CRKN: Canadian Research Knowledge Network

DPS: Depository Services Program

DS: Discovery Systems

FAHSS: Faculty of Arts, Humanities and Social Sciences

ILS: Integrated Library Systems

LSD: Least Significant Difference

IFLA: International Federation of Library Associations and Institutions

MARC: MAchine-Readable Cataloguing

NCLIS: National Commission on Libraries and Information Science

OCUL: Ontario Council of University Libraries

OPAC: Online Public Access Catalog

PDA: Patron-Driven Acquisition

SPSS: Statistical Package for the Social Sciences

CHAPTER 1

INTRODUCTION

The Association of College and Research Libraries (ACRL, 2015b) defines

information literacy as a "set of integrated abilities encompassing the reflective discovery

of information, the understanding of how information is produced and valued, and the use

of information in creating new knowledge and participating ethically in communities of

learning" (p. 12). This skill set includes knowing, accessing, evaluating, and using

information both legally and ethically. Information Literacy has become a significant tool

over the last two decades for students who wish to do research more efficiently due to the

rapid development of electronic resources. However, many university students lack the

information literacy skills required to navigate electronic resources in academic libraries.

Thus, ACRL updated its information literacy standards in 2015 to reflect the needs of

students as they learn to use today's library collections and other resources. These

standards are known as the *Framework for Information Literacy for Higher Education*

(the *Framework*). The *Framework* informs librarians about how to use information

literacy to best suit students' information and research needs. In other words, each library

and its partners on campus need to deploy the *Framework* to "best fit their own situation,

including designing learning outcomes" (ACRL, 2015b, p. 2). In order to guide

librarians' efforts in teaching information literacy to university students, the ACRL

information literacy *Framework* details that university students with sufficient

information literacy should be able to recognize that "1) authority is constructed and

contextual, 2) information creation is a process, 3) information has value, 4) research is

inquiry, 5) scholarship is a conversation, and 6) searching is strategic exploration"
(ACRL, 2015b, p. 1).

Information literacy skills play a significant role in helping students sift through a glut of information and will continue to grow in importance as technology continues to change how information is shared. At all levels within a given library, it is commonly understood that students who receive information literacy training are encouraged to seek out their librarians, resources, and library services, thus increasing the importance of libraries within universities. Boyer (1988) recognizes the importance of information literacy, noting that library staff are equally important to teaching as are classroom instructors and that "students should be given bibliographic instruction and be encouraged to spend at least as much time in the library—using its wide range of resources—as they spend in classes" (p. 165). Information literacy skills are basic and fundamental skills that graduate students need to effectively navigate a library's resources.

Problem Statement

The overwhelming amount of information provided through academic libraries negatively affects graduate students' information literacy skills as students are unable to critically navigate the information available to them (Yevelson-Shorsher & Bronstein, 2018). Since the 1970s and the early 1980s, libraries have been shifting their operations from paper to computerized systems—Integrated Library Systems (ILSs)—that have centralized academic libraries' workflow to provide information about the library collection to the user. Most ILSs are developed by commercial computer companies and are used to track libraries' cataloguing, acquisition, circulation, and the Online Public

Access Catalog (OPAC). Since the 2000s, due to the increase in electronic resource development in academic libraries, ILSs have acquired more tasks, such as electronic resources management (ERM), and are now able to hold information about electronic journals, book platforms, and databases. As workflows become more sophisticated, academic libraries change ILSs in order to accommodate various changes, such as collection formats, which have been converted from print to electronic formats. However, each ILS has a different design, interface layout, system function, system display, terminology, local server base, and cloud base. Thus, shifting from one ILS to another creates confusion among students who use a library's electronic resources. In reference to the University of Toronto's experience with using a new library interface, Gayhart, Khalid, and Belray (2014) observe that "continuity for users was an important consideration when redesigning the library catalogue" and that "web users in general tend to appreciate consistency and predictability" (p. 3). However, when academic libraries switch to a new ILS, they "require new attention to be focused on foundational ideas about that ecosystem" (ACRL, 2015b, p. 2). As a result, a library's information ecosystem changes with ILS development. The very foundational ideas that are required for a successful change in ILS systems are specifically the kinds of foundational ideas that need to be taught so that students are able to navigate different systems using the transferable skills of information literacy to find resources regardless of the system.

In addition to the changes in ILS design, libraries have no control over the electronic resource platforms and databases that are produced by a variety of vendors and publishers, each of which has its own unique characteristics. Since these electronic resources are often pushed through the ILS, these inconsistencies become rapidly

apparent when the library user completes a search because students are not accessing the most relevant information but rather information connected to the software developer. This access divide could create a barrier for university students who use the electronic resources through the ILS and its interface. Librarians, who know the information landscape well, are able to overcome these issues and see them as nuisance rather than an obstacle. However, students who are not information literate may not recognize alternative ways to find the most relevant information.

Consequently, students often turn to Google Scholar for their research. As a search engine, Google Scholar is consistent and predictable, which is one of the most important features of a search engine (Gayhart et al., 2014). Additionally, Google Scholar optimizes the "one stop search" experience by including many resources from a variety of disciplines and formats. Google Scholar's functions and features match the functionality features of ILSs, and some options exceed those of traditional ILSs. Students' preference for using Google Scholar was supported by Becker (2012), who found that all 47 participants in his study unanimously chose Google Scholar as their preferred search method because it "is fast, easy to use, at one's fingertips and quickly produces a ton of information" (p. 341). Becker highlighted the gap in some of the information literacy skills, namely "access" and "use" for the library's collection. In fact, Google Scholar can be used to identify some of the materials' contents and full text using a keyword search, but it does not match the ACRL's (2015b) requirement for information literacy skills for academic research. Although researchers are able to pinpoint the challenges around how students find information, a gap exists around the transferable skills that information literacy is supposed to achieve. Students who learn research skills

around an academic subject are not always able to apply that knowledge in a different discipline.

The ACRL's (2015b) information literacy *Framework* notes that students need to have knowledge-based practices in order to "assess the fit between an information product's creation process and a particular information need" (p. 5). An information product refers to a library's collection of materials, in any format; better products can help students identify the collection of materials efficiently. The creation process is how librarians impart their knowledge of the research process to students. Once students internalize that knowledge, they can then identify the product and successfully decide whether or not the product matches their information need.

In addition, libraries budget cuts have become another factor that contributes to students' challenge with information search. Most academic libraries have been facing severe budget cutbacks for the past five years. As a result, many university libraries have scaled back their physical materials and shifted their budget to support electronic materials. Some university libraries have cancelled print subscriptions altogether. Boissy et al. (2012) note that when academic libraries are dealing with budgets' subject fund allocations, they are not given enough funding to sustain a 3-5% growth in costs for their collections. This changing situation leads to inconsistent resources for the students who search them.

Research Questions

The amount of information is ever increasing. Its format and media have gone through significant changes. University students face great challenges when searching for information that is ideally suited to their area of study. Thus, academic libraries need to

construct new service strategies to support graduate students' information literacy needs

and ensure that libraries remain relevant in the academic community. For example, with

respect to the development of Resource, Description, and Access (RDA), Perez-Lizano

note that "the bibliographic universe was quickly changing, and a new cataloguing

standard was needed in order to correctly catalog in an increasingly digital environment

with new material types, such as websites and digital media" (2016, p. 354). The

implementation of RDA in academic libraries show libraries and their services try to

adapt the development of electronic resources. Furthermore, because most current library

collections can be accessed online, graduate students can obtain materials without direct

contact with a library. Many academic libraries have weathered this change. Ince (2018)

observes that "library services specific to graduate students have become another

important aspect of graduate training" and that "Library services are expanding to include

Data Services and Data Management" (p. 426). These services typically assist statistical

studies; however, the strategies utilized to address these changes have not always been

efficient in terms of teaching information literacy skills.

     While the ACRL Framework provides a guideline about information literacy

today's students need to possess, a survey of the literature shows a limited amount of

knowledge around empirical studies that explore students' informational literacy skills in

the electronic resource environment. The purpose of the current study is to fill the

literature gap regarding information literacy skills in the electronic resources environment.

     According to a survey conducted on the University of Windsor campus, graduate

students used the library's reference services and electronic resources more than

undergraduate students because they often need to complete a well-designed research

project for their theses (Association of Research Libraries, 2013). Therefore, this study will focus on graduate students instead of undergraduates. It explores graduate students' current information literacy status, the challenges graduate students face when using electronic collections, and how the library and/or the faculty can support graduate students with respect to such challenges. Three research questions guided this study:

1. What is the information literacy status of graduate students?

2. What challenges do graduate students encounter when searching for appropriate electronic collections for their research?

3. How could the library and faculty more effectively support graduate students with respect to such challenges?

Significance of the Study

A majority of research in information literacy was designed around the ACRL Information Literacy Competency Standards for Higher Education, which was published in 2000s (Kousar & Mahmood, 2015; Singh, 2005; Teske, 2002). There is little research that has been carried out around the new framework published in 2015. Among the recent available literature, most is commentary and narrative scholarship (Houtman 2015; Scott, 2016). In the most recent literature report, an in-depth literature review found that some studies did evaluated the impact of education programs on students' information literacy using the ACRL standards (Duffy, 2018). However, these studies are far from enough to understand how students map into this *Framework* with their information literature skills. Moreover, these studies focused on undergraduate students instead of graduate students and were conducted outside of Canada (Duffy, 2018). At the University of Windsor, graduate students are very diverse with regard to their cultural origins, geographic

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locations, and ethnic identities. It is necessary to determine the success graduate students have with their information searches in the new resource context that features a new guiding information literature framework. This study is significant since it was designed to explore the relevant information literacy issues faced by graduate students when they navigate libraries' collections and provides suggestions to improve the graduate students' information literacy skills.

Summary and Overview of Remaining Chapters

The changing media of information has created new skill requirements for graduate students. While the new ACRL *Framework* provides guiding lines with regard to new information literacy skills graduate students need to possess, it leaves the rest of the job to universities to prepare students to meet these standards. To this end, it is important to understand where gradate students stand in terms of their information literacy status and what challenges they face when searching information for their studies. This is the primary purpose of the current study. In the following chapters, the researcher outlines the study design and findings. Chapter 2 summarizes the information literacy framework's evolution from the information literacy standard to the framework, as well as its scholars' reaction. This *Framework* acts as a theoretical guide for the study. Chapter 3 reports the literature around graduate students' information literacy skills instruction, its assessment, and the skills they use when accessing electronic resources. Chapter 4 details the mixed methods design of the current study. Chapter 5 reports the findings of quantitative data, while Chapter 6 reports the findings from the qualitative data. In Chapter 7, conclusions are drawn from the study, which inform a discussion on

the implications of the findings with respect to practice and future research. The

limitations of the study are discussed in Chapter 7 as well.

CHAPTER 2

INFORMATION LITERACY FRAMEWORK

The American Library Association (ALA) was founded on October 6, 1876, and it is the oldest and largest library association in the world (ALA, 2015b, para. 1). The ALA's mission is "to provide leadership for the development, promotion and improvement of library and information services and the profession of librarianship in order to enhance learning and ensure access to information for all" (ALA, 2015b, p. 1). The ACRL was founded in 1940, and it is the largest division of the ALA (ALA, 2015a, para. 1). The ALA and ACRL are the higher education associations for librarians and include academic and research librarians around the world. Specifically, the ACRL "develops programs, products, and services to help academic and research librarians learn and innovate within the academic community" (ACRL, 2015b, p. 1). Working on behalf of the ALA, the ACRL leads information literacy research and has issued information literacy standards and the *Framework for Information Literacy for Higher Education*.

The American Association of School Librarians (AASL) is the only national organization in the United States for school librarians. It strives to be proactive regarding "issues, anticipating of trends, and defining the future agenda for the profession through its strategic plan" (AASL, 2015, para. 1). The ACRL's (2015b) *Framework*, its *Information Literacy Competency Standards for Student Learning* (2000), and some of the ALA related guidelines for information literacy innovate within the academic libraries. The ALA and its two divisions (ACRL and AASL) help academic libraries and research librarians with information literacy research and teaching.

According to the ALA, information literacy skills can be regarded as "the set of skills needed to find, retrieve, analyze, and use information" (ACRL, 2000, p. 2). Information literacy in the library field has a long history, dating back as far as 1881, when the objective for library instruction was focused on judgments of the "value of books" and posited that "students need to become independent... and lifelong learners" (Tiefel, 1995, p. 320). In 1974, Zurkowski, the president of the Information Industry Association, was the first to use the concept of information literacy, saying that "People trained in the application of information resources … can be called information literates" (1974, p. 6). Zurkowski offers three assertions about information resources: "(1) information resources are applied in a work situation; (2) techniques and skills are needed for using information tools and primary sources; and (3) information is used in problem solving" (as cited in Behrens, 1994, p. 310).

In 1989, the ALA Presidential Committee on Information Literacy published a progress report on information literacy. The report emphasizes the importance of information literacy to people and businesses, highlights opportunities to develop information literacy, and details an information-age school's "emphasis on information literacy and resource-based learning" (ALA, 1989, p. 7). Ten years later, the AASL prepared the *Information Literacy Standards for Student Learning*, which focuses on student learning and "provides a conceptual framework and broad guidelines for describing the information-literate student" (AASL, 1998, p. 1). In 2000, the ACRL issued a set of standards for information literacy called the *Information Literacy Competency Standards for Higher Education*, which provides "a framework for assessing the information literate" (Saracevic, 2014, p. 19). From the time of its publication until

2014, this standard has played an important role for information literacy for higher education. In 2014, the ACRL drafted a *Framework for Information Literacy for Higher Education*, and on February 2, 2015, it released a new version of the information literacy standard.

Information Literacy Standards and Framework

Between 1881 and 2015, the ALA changed its definition of information standards and framework, as well as its content. These changes have facilitated the retrieval of information from print documents in the 19th century to electronic resources in the 21st century.

During the 19th century, Robinson established "clarification of instructional goals at the American Library Association conference" and declared the need for "purposeful instruction" (as cited in Tiefel, 1995, p. 320). At the time, libraries only had print documents in their collections, and information literacy instruction was called library instruction, though it would later be referred to as bibliographic instruction. In 1961, computer technology was in the early stages of development and did not impact libraries' services and users in a significant way. Print documents made up the overwhelming majority of a library's collection. Thus, the training for library users encompassed "library instruction" and "bibliographic instruction." The purpose of the instruction was to develop students' ability to critically evaluate information and "to become lifelong learners" (Tucker, 1979, p. 271). Since Zurkowski first used the concept of information literacy in 1974, computer technology has developed, and libraries have integrated computer systems into their collections. These collections have been rapidly transferred to digital formats, making the ability to effectively access electronic resources an

essential skill for library users. Consequently, information literacy training became about library instruction, bibliographic instruction, and techniques and skills practice. In 1989, the AASL released the first *Information Literacy Standards for Student Learning* document, while the ACRL would later establish the standard as *Information Literacy Competency Standards for Higher Education*. This change affected academic libraries with respect to information literacy training for more than two decades.

From the early 19th to the 21st century, social and technological changes have had "a considerable impact on libraries and their instruction programs" (Tiefel, 1995, p. 318). As Tiefel (1995) notes, "these changes have created an urgency to teach users how to become more effective, efficient, and independent in their information searching" (p. 318). Thus, the definition of library user education shifted from seeking print materials to a merger between print and electronic resource retrieval.

In 1881, Susie Robinson was the first person to punch "a hole in the lower left corner of the catalog card and run… a rod through all the holes to prevent the removal of the cards" (Nix, 2010, para. 1). At the time, library patrons used library cards to find items in the library collection. In response to this, Robinson spoke at the ALA conference, stating that he "wanted purposeful instruction" (cited in Tiefel, 1995, p. 320). Nearly a century later, Tiefel (1995) pointed to this stance, arguing that students needed to do three things: develop the evaluation skills required to assess information resources, improve self-learning skills through the instruction programs, and become lifelong learners. These objectives include critical judgment, independent learning, and lifelong learning in the information literacy standards and framework today.

Zurkowski first used the concept of information literacy in a National

Commission on Libraries and Information Science (NCLIS) report in 1974, in which he

stated that the concept of information literacy aimed to "achieve universal information

literacy by 1984" (p. 27). Zurkowski also noted that people with adequate information

literacy understand how information resources function in their work: "they have learned

techniques and skills for utilizing the wide range of information tools as well as primary

sources in molding information solutions to their problems" (1974, p. 6). When

Zurkowski first introduced the definition of information literacy, computer techniques

were in their infancy, and electronic resources did not yet exist. However, he envisioned

the techniques and skills that would be needed for using information tools and sources

over 40 years later.

The ALA's Presidential Committee report published in 1989 emphasized the

importance of information literacy, opportunities to develop it, and how people deal with

the realities of the "information age." It outlined six questions that needed to be

addressed:

1. What are the social effects of reading?
2. With electronic media eclipsing reading for many people, what will be the new place of the printed word?
3. How do the characteristics of information resources (format, length, age) affect their usefulness?
4. How does the use of information vary by discipline? How does access to information impact the effectiveness of citizen action groups?
5. How do information management skills affect student performance and retention?
6. What role can information management skills play in the economic and social advancement of minorities? (ALA, 1989, p. 10)

Since the report was issued, the ALA and ACRL have continued to update the

information literacy documents. In the late 1980s, the ALA realized that in the

information age, mass information resources would impact people's reading habits. It

became evident that people would need to use technological tools "to solve problems and create knowledge" (ALA, 1989, p. 9). In addressing this, Saracevic (2014) notes that "efforts in information literacy are rapidly evolving and shifting due to rapid changes in information technology and users' expectations and growing needs" (p. 20). It was under this circumstance that, in 2000, the ACRL's information literacy standards were issued. It covered standards, performance indicators, and outcomes, offering five new standards:

1. Know: be able to "determine the nature and extent of the information needed";
2. Access: be able to "access information effectively and efficiently";
3. Evaluate: be able to critically evaluate "information and its sources critically and incorporate selected information into his or her knowledge base and value system";
4. Use: ensure that information is used "effectively to accomplish a specific purpose";
5. Ethical/Legal: understanding "the economic, legal, and social issues surrounding the use of information and access and use information ethically and legally." (ACRL, 2000, pp. 7-14)

These five standards focus on knowing, accessing, evaluating, using, and ethically understanding information literacy. However, in the early 2000s, Google was just beginning to grow, electronic resources management did not exist, and ILSs were just under development. Consequently, the ACRL's standards referred "students to librarian-created tools such as controlled vocabularies and subject-specific databases" and "direct[ed] users to vetted materials such as articles in scholarly journals or chapters in academic books" (Banks, 2013, p. 185). Library users were not required to have these skills according to the standards set as traditional guidelines.

From 2000 to 2015, the five standards guided librarians teaching information literacy skills to students. Within this time frame, information resources and academic libraries' collections have become increasingly digital and electronic. In response, the

ACRL offered a new definition of information literacy in 2015 based on threshold

concepts laid out in the *Framework for Information Literacy for Higher Education*.

Framework for Information Literacy for Higher Education

Since 2013, the ACRL has organized a paradigm shift from the *Information

Literacy Competency Standards for Higher Education* to the *Framework for Information

Literacy for Higher Education*. This *Framework* adopted the term "threshold" as a major

concept that, as Meyer and Land (2003) explain, "can be considered as akin to a portal,

opening up a new and previously inaccessible way of thinking about something" (p. 1).

The threshold concept has "grown out of pedagogical consideration for education in

economics in the United Kingdom" (Saracevic, 2014, p. 24) and was originally

introduced by British university professors Meyer and Land. The threshold concept was

used "in the design of effective learning environments with disciplines and to indicate the

linkages to ways of thinking and practicing within these disciplines" (Meyer & Land,

2003, p. 10). This concept provides the opportunity to include the students' context and

ideas to adapt the information literacy training. Since then, academic libraries have

created and developed a more open framework for information literacy that includes

information literacy training tools, information literacy course outlines, literacy concepts,

and resources. The goal of these initiatives was to adapt to and help to develop "the

rapidly changing higher education environment, along with the dynamic and often

uncertain information ecosystem in which all of us work and live", which required "new

attention to be focused on foundational ideas about that ecosystem" (ACRL, 2015b, p. 2).

The threshold concept is still an approach that is used as the basis for the 2015

information literacy's *Framework* and seeks to address these concerns. In the ACRL

Framework, threshold concepts are described as the "ways of thinking and practicing within that discipline" (ACRL, 2015b, p.2).

Since the educational environment is rapidly changing, the *Framework* emphasizes the fact that "students have a greater role and responsibility in creating new knowledge, in understanding the contours and the changing dynamics of the world of information, and in using information, data, and scholarship ethically" (ACRL, 2015b, p. 2). It also asserts that librarians are increasingly responsible for "identifying core ideas within their own knowledge domain that can extend learning for students" (ACRL, 2015b, p. 2). When students engage in research with a librarian, the librarian can use their own knowledge within the discipline to accommodate the student's thoughts on a particular topic.

For example, when a student discusses the research topic "standardized testing" and its connection with a particular culture, it is the responsibility of the librarian to present and explain research that has already been done on standardized testing in Indigenous regions as an example of how standardized testing works or does not work in certain contexts. The librarian opens the mind of the student to different ways of thinking about an issue and then works with the student to create a research framework based on the discussion. The librarian is also capable of "creating a new cohesive curriculum for information literacy, and… collaborating more extensively with faculty" (ACRL, 2015b, p. 2). This may occur when a librarian works with the faculty member who is creating a syllabus. In this instance, the librarians can suggest research assignments and even embed themselves as part of the assignment in question. Thus, the librarian becomes part of the curriculum, creating an opportunity for a librarian-student dialogue on a particular issue.

In another instance, an education course on accessibility could be designed with a librarian. Raven and Rodrigues explain that "faculty hoped that a library-based IL course

would address some of these issues" and that "it was important to remember that [such a course] was a library-based course taught by librarians" (2017, p. 7). Together, the faculty member and librarian could discuss different areas on campus where students can interview staff on accessibility. Until that moment, the faculty member may have been unaware this work was happening in the library. As a result, the librarian has engaged both the faculty member as well as the incoming students in new knowledge.

The ACRL *Framework* uses threshold concepts and creates a more open space with flexible options for information literacy implementation in academic libraries. Such an approach is suitable for information ecosystems and environments, such as academic libraries where the rapid development of technologies is perpetually transforming the information environment. The ACRL (2015b) observes that this *Framework* is a conceptual understanding that organizes "many other concepts and ideas about information, research, and scholarship into a coherent whole" (p. 2). This indicates that "threshold concepts are those ideas in any discipline that are passageways or portals to enlarged understanding or ways of thinking and practicing within the discipline" (ACRL, 2015b, p. 2).

Since threshold concepts are central to the *Framework for Information Literacy for Higher Education*, the ACRL outlined six frames, each of which consists "of a concept central to information literacy; a set of knowledge practices; and a set of dispositions" (ACRL, 2015b, p. 2):

- Authority is constructed and contextual
- Information creation as a process
- Information has value
- Research as inquiry
- Scholarship as conversation
- Searching as strategic exploration. (ACRL, 2015b, p. 1)

In this *Framework*, each of the six threshold concepts in the frames above includes three parts: a detailed explanation, knowledge practices, and dispositions. These six concepts work together in a non-prescriptive way to give librarians the ability to teach them in whichever way they choose within the context of their institution. Knowledge practices "are demonstrations of ways in which learners can increase their understanding of these information literacy concepts" (ACRL, 2015b, p. 2). Conversely, dispositions are "ways in which to address the affective, attitudinal, or valuing dimension of learning" (ACRL, 2015b, p. 2). Figure 1 illustrates and understanding about the ACRL's Framework.
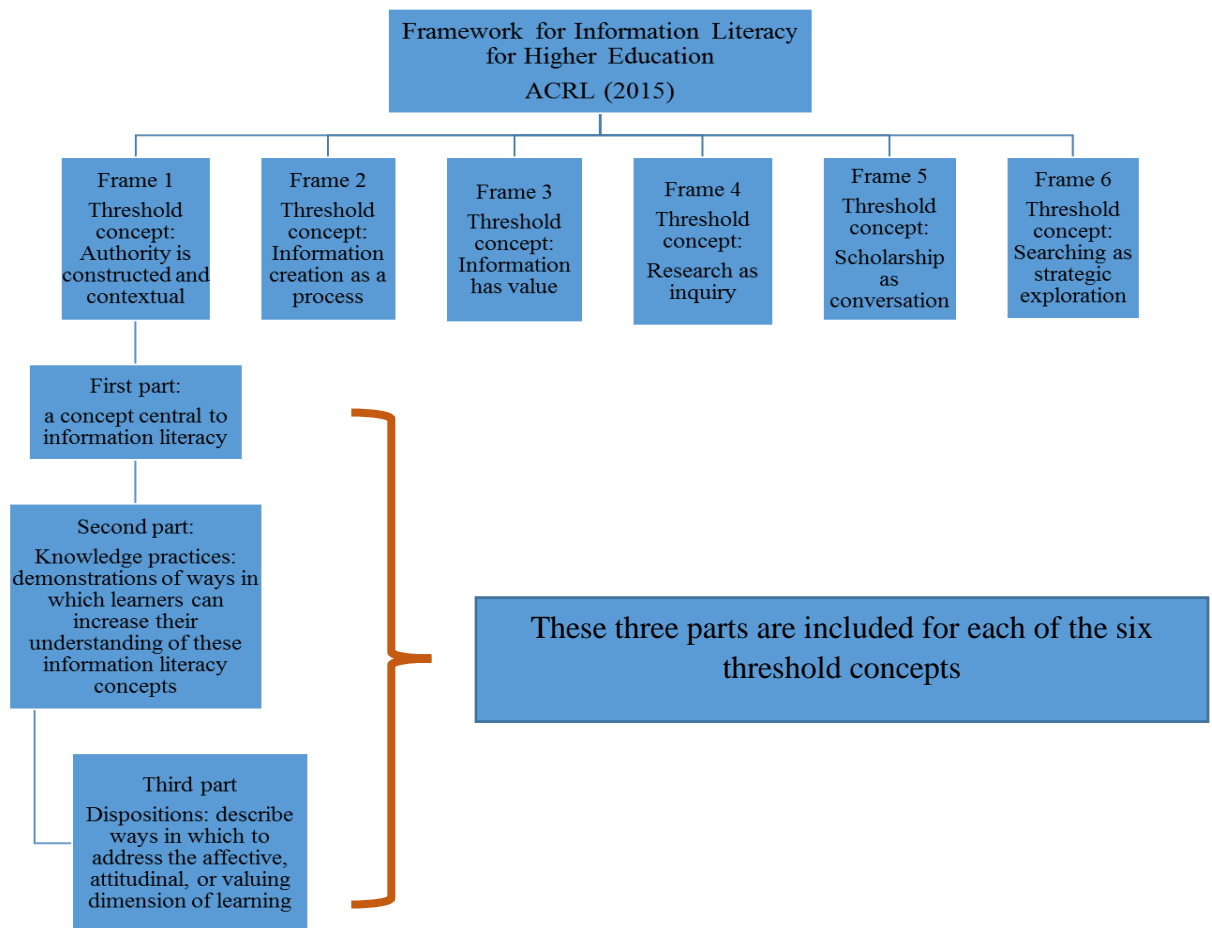
Figure 1. Understanding the Framework.

When comparing the ACRL's *Framework* (2015b) and *Information Literacy Competency Standards* (2000), parallel elements arise. Saracevic (2014), for instance, suggests that the *Framework* looks "similar to Performance Indicators and Outcomes listed for each of five standards in 2000 Standards" (p. 26). However, the "Frames can guide the redesign of information literacy programs for general education courses… and for graduate student education" (p. 26). Saravecic concludes that "this movement may take place over the course of a student's academic career" (p. 26). When the original standards appeared in 2000, they were "understandably cautious about searching the open web" (Banks, 2013, p. 185). *Wikipedia* had not yet ascended to the position it now holds, Twitter was not yet in development, and Google had just entered the market. The ACRL's standards "refer students to librarian-created tools such as controlled vocabularies and subject-specific database[s]" (Banks, 2013, p. 185). The new *Framework* uses threshold concepts and creates a more open structure, matching the electronic resource movement in academic libraries. In reality, using the ACRL's *Framework* can help librarians develop information literacy training guidelines regarding different disciplines.

Scholars' Reactions to Information Literacy Standards

Since 1881, librarians have referred to the theoretical concept of "information literacy" as library bibliographic instruction, library user education, and competency information literacy standards. Today, according to ACRL's Task Focus, librarians may want to refer to library bibliographic instruction, library user education, and competency information literacy standard as the *Framework* of information literacy. The *Framework* is based on threshold concepts, these concepts allow librarians to implement information

literacy instruction using their own experiences and their own lens of knowledge with faculty and administrators when planning, delivering, evaluating, and revising information literacy training guidelines. This changing terminology reflects the shifting aims associated with information literacy, which allows people to become lifelong and independent learners by using concepts that are relevant to them and their experiences. With the advent of electronic resources in academic libraries around the world, the ACRL adopted the six concepts, which have had an epoch-making significance.

While the information literacy training was moving from the ACRL's standards to the ACRL's *Framework*, Pennsylvania State University held an Information Literacy Summit in 2013 to discuss revisions to the ACRL's information literacy standards. Cahoy, Gibson, and Jacobson (2013) presented "Moving Forward: A Discussion on the Revision of the ACRL Information Literacy Standards for Higher Education." Cahoy, a past chair of the ACRL's Information Literacy Standards Committee, observed that the organization was facing the challenge of either retaining the standards they had for the subsequent five years, which they had already done at a previous summit, or completely revamping the standards and rescinding the ones that were no longer beneficial (Cahoy et al., 2013, p. 193). The standards adopted by the ACRL in 2000, which included finding, evaluating, using, and citing information, did not sufficiently address library users' needs or the rapidly changing academic environment. In 2000, Google Scholar was not yet an alternative search engine, library interfaces did not exist, academic libraries' electronic resources were not yet greater than print resources, and graduate students were not curating their own content and information collection on their laptops, mobile phones, and other devices. Cahoy et al. (2013) notes that the revision idea for the information

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literacy standard document cannot be accepted without breaking down everything that had already been built. They also observed that the ACRL was confronting these concerns as they considered revisions for the standard to the *Framework*. The ACRL obtained many recommendations for revising their information literacy standards. Cahoy et al. (2013) note that the "committee decided unanimously that [they] should revise them" (p. 193) and that the committee's decision demonstrated the need to update information literacy standards and move to information literacy. This was required to keep up with technological changes, benefit the people who use information sources, and deal with both information literacy creation and information sharing in the academic world.

The major development in this revision discusses the idea of threshold concepts that distinguish the 2015 revision from previous ones. Regarding scholars' reactions to information literacy standards, Hofer, Brunetti, and Townsend (2013) suggest that threshold concepts will help librarians focus and limit "content to that which is unique to" a librarian's given discipline (p. 111). Librarians can develop their own information literacy teaching outline depending on the individual need based on the *Framework*. These benefits come from threshold concepts. According to Meyer and Land (2003), threshold concepts in the *Framework* involve five criteria that can be used for information literacy training: "transformative," "integrative," "irreversible," "bounded," and "troublesome elements of the research process" (pp. 5-6). Shifting from the standards to the *Framework* provides a new concept for "passageways or portals to enlarged understanding or ways of thinking and practicing" (ACRL, 2015b, p. 2). Consequently,

threshold concepts allow librarians to adapt when teaching information literacy in a rapidly changing, electronically heavy resource environment.

However, within this changing period of time, Harris (2013) argues for the need to reflect on the standards regarding the ACRL information literacy *Framework*: "We must do more and better work to clarify our understanding of the *Standards* dealing with values, information, and information literacy" (p. 142). This understanding will help librarians to better understand the *Framework*. Once librarians' transition from using the standards to using the ACRL *Framework*, they will be able to adapt their understanding to teach the strategies that students can use in any research environment. Thus, the next chapter will focus on the present use of library resources utilized by graduate students, the gaps in the literature around graduate student's information literacy status, and challenges when they use the library collections.

CHAPTER 3

LITERATURE REVIEW

To understand the key issues related to information literacy and the gaps in the current research, it is critical to first summarize the literature related to the history of graduate students' information literacy skills instruction, the assessment of their information literacy skills, and their use of electronic resources. Given that the purpose of the current research is information literacy and its important in library science, it is important to describe how the literature used in the current study was found and selected. A summary of the current literature identifies three overarching themes. The first is the current practices of information literacy, including the evolution of information literacy theory. The second is the status of graduate students' information literacy skills. The third is the factors affecting graduate students' information literacy skills, such as changes in publishers' publication policies and library cataloguing issues.

Search Methods

This study used relevant databases to explore referred journal articles including EBSCOHost Library, Information Science & Technology Abstracts, Emerald Insight, Project MUSE, and ProQuest All Databases. Relevant stand-alone professional journals such as Communication in Information Literacy and College & Research Libraries were also explored.

Several search terms were utilized to ensure that the search results were covered broadly, such as "information literacy skills", "graduate students", "information literacy training", "information literacy skills status", "factors affecting", "electronic resources", and "empirical studies". These search terms were used in conjunction with locational

terms such as "the United States" and "Canada". The time limit was set from the 1990s to 2019. In order to review the literature particularly focused on studies that used the ACRL 2015 *Framework*, special attention was paid to articles published after 2015.

Current Practices of Information Literacy Instruction

In 1989, the ALA released a statement regarding the overall impact of information literacy:

> Ultimately, information literate people are those who have learned how to learn. They know how to learn because they know how knowledge is organized, how to find information, and how to use information in such a way that others can learn from them. They are people prepared for lifelong learning, because they can always find the information needed for any task or decision at hand. (para. 3)

In the 21st century, the ability to effectively select appropriate sources continues to be one of the most important skills for university students, especially the required skills that allow one to define different types of authority. Experts recognize that information creation is valued differently depending on the context, and they view inquiry as a process "that focuses on problems or questions in a discipline" (ACRL, 2015b, p. 7). Hence, information literacy skills can help university students to effectively use electronic resources, such as e-books and e-journals, and information from the Internet. Libraries and librarians who "provide a significant public access point to such information… play a key role in preparing people for the demands of today's information society" (ALA, 1989, p. 5). Hooks, Rahkonen, Clouser, Heider, and Fowler (2007) note that in university libraries, teaching students has been "a challenge for academic librarians for most of the twentieth century and has emerged as a high priority for

academic librarians in the twenty-first century as well" (p. 147). Alimohammadi and

Sajjadi (2006) agree that librarians have been embracing the information seeking

challenges of students, and "have planned a wide range of instructional courses [that are]

different in scope and depth to tackle these new issues" (p. 1).

To improve students' information seeking ability, many libraries have made

information literacy a high priority in their strategic plans. For example, in its strategy for

21st century literacies, Western University library states information literacy is an integral

part of the Western Degree Outcomes and reflects the spirit of the new literacy

Framework (Adam et al., 2017). In University of Windsor, the library is considered "as a

hub for research and learning activities" (Leddy Library, 2012, p. 1). Instead of a

traditional source provider, libraries should be fully engaged in teaching students how to

find and evaluate recourses that support their research and study.

Due to the rapid development of informational and technological environments,

information literacy has become an increasingly central skillset in academia. Information

literacy training not only improves students' information literacy skills, it also gives

faculties and librarians opportunities to familiarize themselves with users' needs.

Yevelson-Shorsher and Bronstein (2018) note that information literacy skills are viewed

as critical skills and students are expected develop them during their studies. The library

staff in their study "were aware of students' difficulties in acquiring these skills and…

made efforts to develop programs to remedy the situation" (p. 535). Yevelson-Shorsher

and Bronstein (2018) conducted a qualitative survey to explore the collaboration between

the faculty and the librarians in offering training to students. They argue that when

information literacy training is developed jointly by faculty and librarians who consider

students' views and opinions, both can share their experience and knowledge and provide students with a more well-rounded education. Yevelson-Shorsher and Bronstein (2018) likewise suggest that students who did not take the time foster a relationship with their librarians found it difficult to improve their information literacy skills. It is easy to understand that, without building a relationship between the library and the students, it will be more challenging for students to understand the library and use its collections and services effectively and efficiently.

In the 2000s, researchers started to focus on how changes in technology influenced academic library users' experience. Bhatti (2007) suggests "changes in technology, society, and educational systems [have had] a considerable impact on libraries and their instruction programmers" (p. 49). This is mainly due to the way that the Integrated Library Systems were organized. As these systems have become more technologically sophisticated, students have had to adapt to these systems and also understand the way to use the systems to their full potential. Each new system creates a new and more complex way to search and requires users such as students to become as equally sophisticated in their search strategies. This has impacted information literacy training because librarians have had to teach about the strategies for searching rather than focusing solely on the systems. Their search strategies have become increasingly important since 2010 when electronic resources made up close to 90% of academic libraries' collections, and the use of online services has become a primary activity for users.

Todorinova and Torrence (2014) argue that "library users prefer a welcoming environment that provides the opportunity for self-sufficiency" (p. 37), while Kennedy

(2011) suggests that 21st century librarians address users' needs by "embedding research help in the context of the online research environment, while at the same time respecting the users' preference for a transparent and unmediated experience" (p. 319). As Tucker (1979) notes, it is clear that "transparent and unmediated experience" (p. 271) speaks to a user's self-sufficiency, which requires a higher level of information literacy skill for librarians, library staff, and library users alike. Therefore, in the context of electronic resources, the top priority for academic libraries is to train library users as "independent and lifelong learners" (Tucker, 1979, p. 271).

Chen and Lin (2011) have explored information literacy issues in Taiwan's academic libraries and investigated the strategies used to cultivate information literacy in academic libraries. They "systemically surveyed and reviewed publication[s] related to information literacy and library user education" (Chen & Lin, 2011, p. 399) and conclude that having an information literacy training program "benefits [a] library and its staff, faculty, and students" and that "librarians should play a leading role in the design and operation of programs" (p. 399). They go on to recommend that IT professionals and students should collaborate with faculty and that information literacy training should "be embedded in the curriculum" (Chen & Lin, 2011, p. 399). This means that the librarian should be "involved in the provision of information literacy in resourcing relevant materials, facilitating the use of those materials, and providing a collaborative focus for partnerships. The effectiveness of the library needs to be promoted and evaluated in terms of its impact on educational and research outcomes" (Chen & Lin, 2011, p. 405).

With regard to information literacy assessment, Warmkessel (2008) argues that the ACRL's standards function as an assessment tool that can measure graduate students'

information literacy skills and also serve as guidelines that provide "explicit expectations for institutions to assess IL as part of their assessment of student learning" (p. 224). Likewise, Flower (2004) discusses how Alberta's academic librarians created *The Information Literacy Assessment and Advocacy Pilot*, while Sharum, Thomson, Goebel, and Knoch (2014) "established a shared vision and understanding of what constitutes basic IL skills" in order to "facilitate the measurement of student learning following an IL session" (p. 539). These assessments of information literacy followed the older version of the ACRL's standards. Between 2015—when the ACRL's *Framework* was issued—and 2019, there has been little assessment data reported. This study will be among the pioneer efforts to assess graduate students' information literacy using ACRL's Framework.

Information Literacy Skills Status of Graduate Students

Information literacy is by no means a new topic in the literature. Beile O'Neil established the Beile Test of Information Literacy for Education (B-TILED) survey instrument in 2005 to measure students' information literacy skills. She provided descriptions about the approach she used to develop the test content and as well the procedure for the development of the instrument (O'Neil, 2005). O'Neil developed this survey instrument because she realized that though "information literacy instruction affects the scholarly output of students," there was a lack of data on library instruction and the ways in which it improved scholarship (2005, p. 49). The use of this instrument for doctoral research within the last 10 years includes at least four studies: Cannon (2007), Magliaro (2011), Calhous (2012), and Tang (2013). This instrument can help researchers with "program reviews, to inform instructional and curricular decisions, and to provide a deeper understanding of the construct" (2005, p. 49).

Magliaro (2011) conducted a study that used the B-TILED survey and incorporated the Technology Acceptance Model (TAM) and the Affordance Theory (AT) frameworks. She found that a number of things were lacking with respect to information literacy, including overall graduate students' information literacy skills, staff numbers within the library, librarians who focus on students' information literacy training, communication between libraries and faculties regarding service issues, and understanding with respect to graduate students' needs (Magliaro, 2011). When discussing graduate student information literacy skills, Magliaro specifies that students "did not have adequate training in the use of library services, and some were not aware of the services the library could provide to them" (p. 23).

Sadler and Given (2007) used affordance theory to guide their research into graduate students' information searching behavior. Their "in-depth, qualitative interviews with graduate students and academic librarians explored how the students perceived and used the library's various 'opportunities for action'" (p. 115). They found that students did not understand the impact of information literacy skills and therefore did not seek out these types of sessions from the library or the librarians. Their findings indicate "a disparity between expectations and experience and point to graduate students as an underserved population in this context, especially in terms of the library's outreach efforts" (p. 115). They found that "a lack of awareness among graduate students about information literacy instruction may also play a major role in their avoidance of it" (p. 128).

Barrett (2005) designed an exploratory study of the information-seeking behavior of humanities graduate students in 2005. Barrett surmised that there were many issues

experienced during information literacy training and wrote that many graduate students lack the basic ability to effectively use the library and its resources. Graduate students understood that there are many ways and tools with which to search for information, such as online catalogues and databases; however, they did not address the most effective strategies for using each tool. Undergraduates, by comparison, lacked the collegial resources that faculty members take for granted, and most lacked knowledge and experience in the areas they were studying. Some of the issues can be traced back to library collections, namely that limited primary sources could be found via electronic resources. Additionally, these students did not have the substantial subject experience in the areas they were researching during the early stages of their programs.

In their study of graduate students' information literacy self-efficacy and applied skills, Robertson and Felicilda-Reynaldo (2015) found that an evidence-based nursing practice requires information literacy skills. When students encounter search obstacles, they often change the search terms or database, as opposed to utilizing practices taught via information literacy training, such as advanced search methods that can expand or refine the search to produce better results. Earlier researchers Duke and Asher (2011) had already posited that graduate students tend to overestimate their information literacy skills and lack the information literacy skills required to effectively use the bibliographic databases available on the Internet.

The information-seeking behaviour of graduate students was further explored by Korobili, Malliari, and Zapounidou (2011) through a survey-based study with roughly 870 graduate students and a response rate of about 27% at the Aristotle University of Thessaloniki (Greece). They found that graduate students lacked information literacy

skills. According to their survey, the majority of participants demonstrated a low to medium level of information-seeking skills. Graduate students, for example, "did not seem to be well acquainted with information retrieval activities and were unable to evaluate sources" (Korobili et al., 2011, p. 161). Based on "statistically significant relationships," Korobili et al. (2011) argued that graduate students in the study lacked the knowledge and skills required to "retrieve information effectively from e-sources and search engines" (p. 161), and that they lacked computer experience with regard to retrieving information from databases and e-journals.

To address the inadequate information literacy skills among students, the Association of Research Libraries ([ARL], 2013) organized a large-scale survey at the international level using LibQUAL+®, which is "a suite of service that libraries use to solicit, track, understand, and act upon users' opinions of the library service quality" (p. 7). There were more than 1,000 participants in the LibQUAL+® survey, which included university libraries and college libraries around world, including the University of Windsor. Based on the daily survey results (Tables 1 and 2), graduate students use the library's resources with greater frequency (31.40%) than undergraduate students (11.11%). However, undergraduate students (74.16%) use Yahoo and Google with greater frequency than graduate students (65.29%). This could be due to undergraduate students' awareness of online sources of information that are part of the library's subscription packages.

Table 1

LibQUAL+® 2013 Survey Results for Undergraduate Students

	Daily		Weekly		Monthly		Quarterly		Never		Total	
Question	N	%	n	%	n	%	n	%	n	%	n	%
How often do you use resources on library premises?	121	17.66	281	41.02	162	23.65	89	12.99	32	4.67	685	100.00
How often do you access library resources through a library Web page?	76	11.11	290	42.40	183	23.75	86	12.57	49	7.16	684	100.00
How often do you use Yahoo, Google, or non-library gateways for information?	508	74.16	103	15.04	40	5.84	16	2.34	18	2.63	685	100.00

Table 2

LibQUAL+® 2013 Survey Results for Graduate Students

	Daily		Weekly		Monthly		Quarterly		Never		Total	
Question	N	%	n	%	n	%	n	%	n	%	n	%
How often do you use resources on library premises?	51	21.07	79	32.64	58	23.97	40	16.53	14	5.79	242	100.00
How often do you access library resources through a library Web page?	76	31.40	119	49.17	37	15.29	6	2.48	4	1.65	242	100.00
How often do you use Yahoo, Google, or non-library gateways for information?	158	65.29	59	24.38	18	7.44	3	1.24	4	1.65	242	100.00

Even when comparing daily access to library resources versus access to Yahoo and Google, graduate students still use non-library gateways (65.29%) for information rather than a library webpage (31.40%). This could signal that on a daily basis graduate students are still more comfortable seeking information for their research outside of the library.

More recent studies have found inadquate information literacy skills among unviersity students. For example, Bezet, Duncan, and Litvin (2018) conducted a Research Consultation Satisfaction Survey from 2014-2016 with a total of 171

respondents. The participants included 165 (96 %) students, 5 (3%) staff, and 1 (0.6%) faculty member. Their survey results suggest that the majority of "students are unfamiliar with basic library research skills" and that "students do not seem to be aware of basic search techniques, such as phrase searching or the use of Boolean operations" (Bezet et al., 2018, p. 6). This research confirmed the earlier research outcomes that Barrett (2005) and Korobili et al. (2011) discussed regarding graduate students and their lack of information literacy skills. Specifically, since most graduate students do not attend the information literacy sessions, the skills that are taught within those sessions may not be readily known to them. This includes "information retrieval techniques (keyword, phrase, Boolean search, and truncation) and use of Library online resources and tools (e-journals, online databases, e-books, [and] OPAC" (Korobili, 2011, p. 161). Recently, Yevelson-Shorsher and Bronstein (2018) examined four research questions using "data collected from 32 semistructured interviews [that] were analyzed using thematic analysis" (p. 535). Their research findings offer three conclusions: 1) students felt they lacked adequate information literacy skills, 2) they did not receive sufficient help from their faculty, and 3) they were unaware of the resources and services the library offered.

To summarize, with the transition of information media from print to electronic, students have faced many challenges while searching for information during their research. Their ability to locate, evaluate, and use information was not adequate. One could argue that since information technology has been popular for quite a while, students today should be able to bring their information search skills with them as they enter post-secondary education. However, few recent studies continue to express the need of information literacy improvement among students. The reasons behind this fact might

be due to the wide range of student abilities, their age differences, the digital divide between regions and cultures, as well as the differences between the way information is packaged and consumed for academic use versus popular use. Therefore, there is a need to further study students' information literacy skills and develop ways to improve them.

Factors Affecting Graduate Students' Information Literacy Skills

The increasing prevalence of electronic resources was demonstrated by the Publishing and Depository Services and the Depository Services Program (DSP). From 1955 to 2014, the DSP provided the Weekly Checklist of Canadian Government Publications Catalogue to all of the repository institutions across Canada. A cumulative publication of the monthly catalogues and daily checklists provided the basis for publication information for repository institutions, including academic libraries in universities. At the time, government documents carried no charges for binding and shipping. However, Public Works and Government Services Canada (2013) announced that December 2014 would mark the final print issue for this record. Furthermore, regarding the DSP, Public Works and Government Services Canada announced that, "On December 31, 2013, the agreements between the DSP and the depositories expired" (p. 1). Since April, 2014, the DSP has stopped "distributing tangible-format publications and [has] transition[ed] to an electronic–only model" (p. 1). Government documents are fast becoming exclusively available in online formats, and there is no indexing for these publications. As a result, it has become a challenge for users and librarians to explore the government documents collection.

In addition, serial and monograph cataloguing was a bigger task for library technical services. Since academic libraries started to use cloud technology for the Integrated Library System, e-journal and e-book records are shared with knowledge base records with the

library consortium. For example, Ex Libris Alma (an integrated library system) has a Community Zone as the knowledge base in order to share electronic resources within the Alma community. Therefore, batch cataloguing as "editing and adding large batches of MARC (machine-readable cataloging) records to a cataloguing at once" (Turne, 2015, p. 303) has become the main method for uploading electronic resources. Young (2012) completed a survey for batch cataloguing in Virginia Tech and concluded that "Batch cataloguing in libraries has become increasingly common in recent years", which is partly due "to large sets of electronic resources that need to have bibliographic records entered in the catalog when a subscription becomes valid" (p. 22). This phenomenon impacts the quality of the bibliographic records because some of the records are provided by the publisher with the package purchase, and in some cases the "subject heading" and "access point" do not follow the cataloguing standard. In many instances, central information is not described, which impacts the record's index and retrieval of a library's collection.

Since the early 2000s, collection development has targeted electronic resources. The purchasing of e-journals, e-books, and databases make up the majority of formats in academic libraries. Electronic package subscriptions group thousands of journals and books along with usage statistics for the package. This informs librarians when some of the titles are not being used. A new acquisition model includes programs like Patron-Driven Acquisition (PDA). Polanka (2009) explains that "PDA stems from two traditional collection development principles—purchasing titles based on patrons' suggestions and establishing approval plans" (p. 121). Although at first glance, this seems inconsequential to students or their learning, it is actually part of their information literacy training. As noted in the third frame of the information literacy framework,

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"information has value". This value can be defined by "publishing practices, access to information, the commodification of personal information, and intellectual property laws" (ACRL, 2015b, p. 6). However, a "novice learner may struggle to understand the diverse values of information in an environment where 'free' information and related services are plentiful (ACRL, 2015b, p. 6).

This concept is challenging for information literacy training and even more challenging when students do not realize the impact of their choices when they are in the library web environment. When students are looking for information, they would typically not think about how their choices impact the library's collection. For example, in a patron driven acquisition environment, it costs the library different amounts if students browse titles or download them. Students who cannot appreciate this fact may simply download many resources without thinking about how the library will pay for them. In 2010, the Ontario Council of University Libraries' (OCUL) PDA implementation determined that both librarians and library users need to learn more about how library subscriptions work in order to build a collection that accommodates the needs of each library's users along with the responsibility that we all share when using the library collections.

Davis, Jin, Neely, and Rykse (2013) state that the PDA "allows a library to offer a wide selection of material to its users without making a purchase until the item has been requested or used" (p. 183). Students who are not information literate may not appreciate or know about these nuances around purchasing materials. The OCUL started exploring this PDA pilot with the publisher called ebrary in 2010, enlisting Western University and the OCUL member libraries. The results suggest that "of the 467 PDA titles purchased

for the consortium, 169 titles represented unique content for Western Libraries, [and] 278

titles duplicated content already owned in print and/or electronic format" (Davis et al.,

2013, p. 185). This means that only 36% of content was actually used and unique; 60% of

the contents were duplicated. However, libraries still continued to pay for 100% of this

content. Although this PDA pilot did not succeed, it provided the libraries with

experience and helped with further development of the PDA model.

Newton and Dixon (1999) argue that as technology changes the social and

educational climate, information literacy should be considered part of professional

competency:

> Technological development and professional change have focused rather narrowly
>
> on computer competencies. There is a need to examine the profession's new roles
>
> much more broadly if information professions are to highlight their unique
>
> contribution to managing the new information environment and facilitating end-
>
> user access to online information. (p. 151)

Newton and Dixon (1999) found that advancements in computer competencies are

changing the responsibilities of information professionals, drawing a correlation between

"how user education is delivered and how professionals are trained to deliver the successful

integration of systems" (p. 152). They recognize that information professionals need to

"develop specific skills [with regard] to handling Internet hardware and software" (p. 152).

The value of these skills is reinforced by Korobili et al. (2011), who determined that

76.2% of students believed they were "experienced in retrieving information from search

engines" while "only 33.2% perceived themselves as very experienced in retrieving

information from database or e-journals" (p. 157). Moreover, respondents noted that their

"experience with computers and… search engines seemed to have affected the choice of certain search techniques, modification of initial statements and the way they perceived relevant results" (Korobili et al., 2011, pp. 158-160). Korobili et al. argue that graduate students need information literacy training to help them address changes in information-seeking behaviour, such as bibliographic training and searching skills training. According to the ACRL's *Framework*, graduate students should already possess this basic information literacy before beginning graduate or postgraduate studies. The focus of information literacy skills development is often set to improve the skills of first-year undergraduate classes. However, that is only if the subject librarian and the course instructor schedule time for the instruction to take place during class time. This lack of information literacy among graduate students highlights a significant issue that postsecondary institutions need to address.

A lack of knowledge of search techniques is also a barrier for graduate students accessing electronic resources. Sadler and Given (2007) argue that "in the case of information technology in libraries, some participants saw the many conveniences offered them by the library as also offering a dark side" (p. 126). For example, "some students expressed fears of becoming dependent on technology" and they worried that technology would "make them lazy, or that they [may] leave university not knowing how to conduct research in a library with fewer digital resources" (Sadler & Given, 2007, p. 126). In the last decade, electronic resource use in libraries has grown exponentially (Millet & Chamberlain, 2007). Consequently, students have been exposed more frequently to these as well and their thoughts on using these resources is of interest in this present research, especially to see if Sadler and Given's thoughts still hold true today.

Google Scholar is another way to access electronic resources. It is "a freely

accessible web search engine that indexes the full text of scholarly literature across a

wide variety of publishing formats and disciplines" ("Google Scholar," 2018, para. 1). It

includes links for electronic resources available through subscriptions at academic

libraries. Becker (2012) notes that community college participants unanimously selected

Google as their primary search engine because it "is fast, easy to use" (p. 474) and

quickly produces a plethora of results. Stirbu, Tirion, Schmitz, Haesbroeck, and Greco

(2015) observe that "based on automatic reference recognition and through agreements

with its partners, Google provides access to articles, theses, books and abstracts from

academic publishers, professional societies, online repositories, universities, and other

websites" (p. 323). However, Google Scholar does not provide the exact years of

coverage for results, even though the university or college might have complete access to

the publication and some of the subscribed electronic resources needed for login

information. Google Scholar also does not cover current copyright policy issues related to

the journals that appear on their searches. Van Aalst (2010) highlights some of

complaints that librarians and information scientists have regarding Google Scholar,

namely that it "provides much less information about the journals included in its database

than do other databases and that the processing of results for future analysis is much more

labour intensive" (p. 391). The library professionals who took part in the study concluded

that graduate, postgraduate, and professional researchers should use academic libraries'

electronic collections as the primary research tool.

Due to rapid and constant technological developments and the increase in

electronic resources, librarians must not only develop graduate students' information

literacy skills but also work in concert with information literacy stakeholders to develop

strategies for information literacy training. To accomplish this, Magliaro (2011) argues

that an ongoing investigation into the information literacy skills of graduate students is

needed, "especially given the continuous evolution of new online technological research

tools" (p. 5). Once this is done, and the information literacy skills of graduate students are

adequately developed, the collections offered by academic libraries can be used

effectively, thus improving both the overall research experiences and the quality of

graduate students' research results.

CHAPTER 4

METHODOLOGY

This study investigated the status of graduate students' information literacy and the challenges they face using the library's electronic collections. The study employed a convergent parallel mixed methods design. Quantitative data were collected through an online survey, while qualitative data were collected through focus groups.

Convergent Parallel Mixed Methods Design

A convergent parallel mixed methods design involves collecting both quantitative and qualitative data, analyzing them separately, and then comparing and/or relating the results (Creswell, 2014, p. 219; see Figure 2). It takes advantage of the strengths of one type of data to offset the weakness of the other form. Quantitative and qualitative data depend on each other to demonstrate stronger links within both data sets, which in turn provide an in-depth and valid understanding of the study topic.
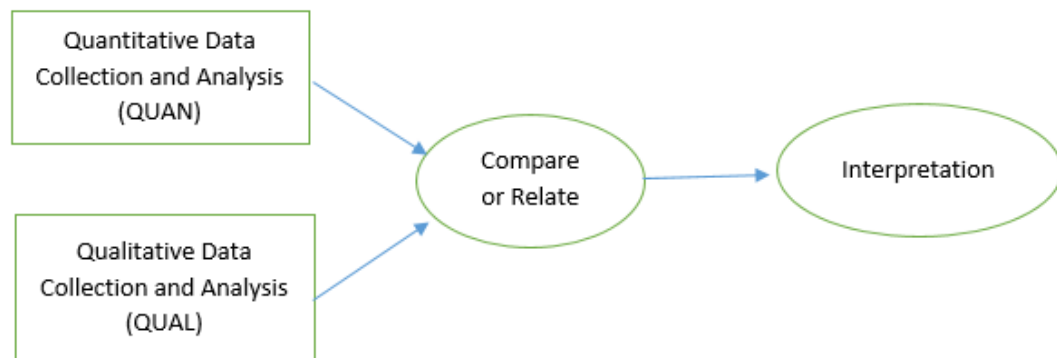
Figure 2. Convergent parallel mixed methods (Creswell, 2014, p. 220).

Quantitative data were collected through online survey questionnaires using FluidSurvey software. The online survey collected data for three purposes: (a) to identify the average student's level of competency with respect to information literacy, (b) determine students' knowledge regarding use of the library's electronic resources, and (c) provide a statistical examination of the library's information literacy training by investigating students' competency and knowledge. These quantitative data helped the researcher understand graduate students' information literacy needs regarding library collections during the latter's transition from print to electronic formats.

Qualitative data were collected through focus-group discussions. Focus groups collect in-depth information about the issues covered in the survey as well as other relevant topics that were not in the survey questionnaire. Some of the focus group questions were developed to understand the findings from the survey. For example, question 10 asked whether students used the troubleshooting system when they used the library's electronic resources. The results from the survey demonstrate that only seven participants (5.7%) used this service. The remaining participants were either not aware of it or did not use it. Within the focus group, this question was followed up with an inquiry into whether or not the participants were aware of the library's troubleshooting system. Only two participants used it, and most of them did not know the library offered this service or where it was located on the library's website. Other questions were covered in the focus group that were not included in the survey, such as questions regarding whether participants knew the difference between the results offered by Google Scholar and Primo, a search engine that provides a single-search interface for print, electronic, and

digital collections. These questions offer pertinent insights regarding information literacy skills such as search strategy and knowledge of electronic resources.

The data identified graduate students' information-seeking preferences and their knowledge of the library's electronic resources. The focus groups' guiding questions corresponded to concepts addressed in the online survey. Based on participants' explanations, the researcher obtained feedback regarding participants' satisfaction with library services, as well as an in-depth understanding about graduate students' information literacy. Dilshad and Latif (2013) note that focus groups provide synergy and interaction between group members; they are a valuable tool for collecting qualitative data and useful for planning, improvement and evaluation of certain programs. Gathering such qualitative data also helps the researcher describe the research problem more fully by exploring a concept or phenomenon derived from quantitative data (Creswell, 2014).

This study used semi-structured, open-ended questions to gather qualitative data (see Appendix D). Using this methodological approach, it was critical to interpret the connection between quantitative and qualitative results. This convergent parallel mixed method helped the researcher further understand graduate students' current information-literacy status and challenges.

In addition to the data collected through online survey and focus groups, the researcher used some data from ELECPROD reports. ELECPROD is the library's troubleshooting system, and it is monitored by the bibliographic services department. Its reports are used to explain the current issues for the students' using electronic resources within the library. Some of the issues that ELECPROD uncovered were related to students not being able to use the links through the electronic resources page, not being

able to understand the holdings screen to determine if the article they were looking for existed, and the organizational reasons behind broken links. ELECPROD-reported issues substantiated the findings from the online survey and focus groups.

Research Participants

The study primarily targeted graduate students in the University of Windsor's Faculty of Arts, Humanities and Social Sciences (FAHSS) to participate in the online survey and focus-group discussions, and did so for several reasons: (a) the majority of FAHSS graduate students were registered in thesis-based programs and therefore likely to be familiar with extensive literature searches; (b) results from the LibQUAL+$^{®}$ 2013 Survey revealed that graduate students used the library resources more often than undergraduate students; and (c) the LibQUAL survey results also indicated that graduate students in Human Kinetics and Arts/Humanities programs used the library services more often than graduate students from other programs such as science, who often rely more on report writing in their respective projects. In other words, because this study sought to explore graduate students' ability to search the library's collection, as well as their perception of information literacy training, the researcher chose FAHSS graduate students because they typically use library resources more frequently and undertake more thorough searches. The study, however, did not intend to investigate differences between information literacy of FAHSS graduate students and graduate students from other faculties.

The researcher worked closely with the University of Windsor's Faculty of Graduate Studies to obtain enrolment information of graduate students in all FAHSS programs, which are listed in Appendix C. The total number of all full-time and part-time

graduate students in all FAHSS programs during the 2017 Winter Semester was 626 (see Table 3). The largest program enrolment corresponded to the School of Social Work.

Online Survey Data Collection

In compliance with the Tri-Council Policy, the researcher received approval from the University of Windsor Research Ethics Board, and data collection was undertaken from January to March 2017. For the online survey, the researcher obtained permission to send a mass email to FAHSS graduate students using the University of Windsor's IT Services. The online survey modified questionnaire (see Appendix B) was uploaded to the IT Services website, and the mass email was sent out beginning on January 19, 2017 until March 16, 2017. As noted earlier, the quantitative data was collected using FluidSurvey. The survey used multiple-choice questions but also allowed participants to elaborate on their answers by writing comments. The study was designed as convergent parallel mixed methods to evaluate graduate students' information-literacy skills based partly on their perceptions of the latter and partly on quiz questions, which tested their knowledge. Regarding the online survey instrumentation, B-TILED survey questionnaire (see Appendix B) has been used at least four times from 2005 to 2013 for successful doctoral research. In addition, before the online survey, the survey questions were tested and revised by librarians. FluidSurvey helped to create and manage their personal responses and provided the data needed to measure the strengths and weaknesses of the library's information-literacy services. Therefore, this online survey data was collected successfully.

Table 3

Number of Full- and Part-Time FAHSS Graduate Students per Program

FAHSS graduate program	No. of graduate students		
	Per department	Full-time	Part-time
Communication, Media & Film (MA)	12	12	0
English Language & Literature (MA)	18	17	1
History (MA)	24	24	0
Philosophy (MA)	14	14	0
Political Science (MA)	29	28	1
Psychology (MA)	30	30	0
Psychology (PhD)	66	65	1
Creative Arts (MA)	14	14	0
Sociology and Anthropology (MA)	28	28	0
Sociology and Anthropology (PhD)	10	9	1
Social Work (MSW)	364	364	0
Social Work (PhD)	17	17	0
Total:	626	622	4

Note. Data supplied by the Office of Institutional Analysis, University of Windsor (2017).

Survey Data Collection Process

Responses to the online survey began to arrive on the second day following the distribution of the mass email. A second mass email was sent as a reminder one week after the first mass email had been sent; however, only 46 responses (7.8% of the original 626 potential participant pool) were received. The target number in the original mass

email system was 591 of the total 626 students provided by the Office of Institutional

Analysis. Because of the low response rate, the researcher used several recruitment

strategies in order to increase participant response rates. First, the researcher contacted

the Dean of FAHSS and obtained a letter of support from the Dean, which was inserted

on the first page of the online survey in order to encourage all FAHSS graduate students

to participate in the online survey. Second, administrative assistants in the FAHSS sent

two additional group emails to FAHSS graduate students as a reminder to join the online

survey and also helped the researcher determine the most efficient way to connect with

the graduate students, such as attending group gatherings and lectures. Third, the

researcher used the University of Windsor's faculty and staff Student Information System

(SIS) to obtain FAHSS graduate studies class sizes and information on course instructors

teaching those classes that semester. The researcher then emailed the instructors to obtain

permission to visit their classes and promote participation in the study. Nineteen

instructors in FAHSS granted the researcher permission to visit their classes and verbally

informed students about the online survey. Some instructors also posted a link to the

online survey on their respective course website.

The additional recruitment strategies yielded the following results: the FAHSS

administrative assistants' emails increased the response number to 51; the researcher

made a total of 19 classroom visits, which helped to further increase the number of

responses by 33; and group emails sent to students by some of the course instructors

resulted in an additional seven responses. Together, these steps increased the

participation from the original 7.8% to 23%. In the research by Watt et al. (2002) for

electronic course surveys, the overall response rate for online surveys was 32.6% when

surveying for them management taught through distance education. According to FluidSurvey data regarding average response rates, "when surveying the general public, a response rate of 24.8% looks great when compared to the telephone surveying standard of around 8-12%" (FluidSurveys Team, 2014, para. 5). Based on Watt et al. (2002) and the FluidSurveys Team (2014) review and discussion with the researcher's supervisor, the study's 23.18% response rate is considered acceptable for its online survey. In sum, the total number of responses to the online survey reached 137 participants, or 23.18% of the total FAHSS graduate student population.

In order to encourage the graduate students to participate in the online survey, the researcher also offered a draw for bookstore gift cards. The researcher used a "Random Number Generator" method to randomly pick some participants' numbers within the name list; six participants were selected and they picked up the gift cards from the researcher's office.

Online Survey Responses

Scores corresponding to the online survey responses were tracked in minutes. The amount of time a student spent on the survey was approximately 30 to 40 minutes, depending on students' English fluency level, understanding of information literacy, or a number of other factors, such as time allowed for classroom visits. The online survey responses were categorized as "complete" and "incomplete" and both categories of results had weighted lower scores. For example, if a participant spent fewer than 6 minutes on the survey and answered fewer than 10 questions, it was regarded as a weighted lower score; however, these responses were still considered valid. Furthermore, there were 14 empty results for responses in "incomplete"; these responses were

considered to be invalid. Ultimately, a total of 85 (out of 137) responses were "complete" (including one empty response); 52 responses were "incomplete" (including 14 empty responses); and 9 responses were weighted lower score. In all, the total number of responses was 122, it was a high proportion of answered questions for typical survey responses.

Focus Group Data Collection

Focus groups were designed to answer two parts of the research questions regarding the preferences for seeking information and using electronic resources. Based on FluidSurvey responses, the focus groups were administered with three groups and conducted from March 21 to 23, 2017.

The current study employs Creswell's (2007b) data analysis spiral (Figure 3), which means that the researcher will engage "in the process of moving in analytic circles rather than using a fixed linear approach" (p. 150). Following the Account (narrative) to Data in the Creswell data analysis spiral, the researcher formed conclusions based on several facets of analysis and circled around several times. After the qualitative data were gathered, which was the beginning of the spiral, they were converted into formats that could be organized and examined.

Account (narrative)

Representing — Matrix

Describing — Context, categories

Reading — Writing notes

Data Managing — Organizing

Data

Adapted from Creswell, 2007, p. 150-151
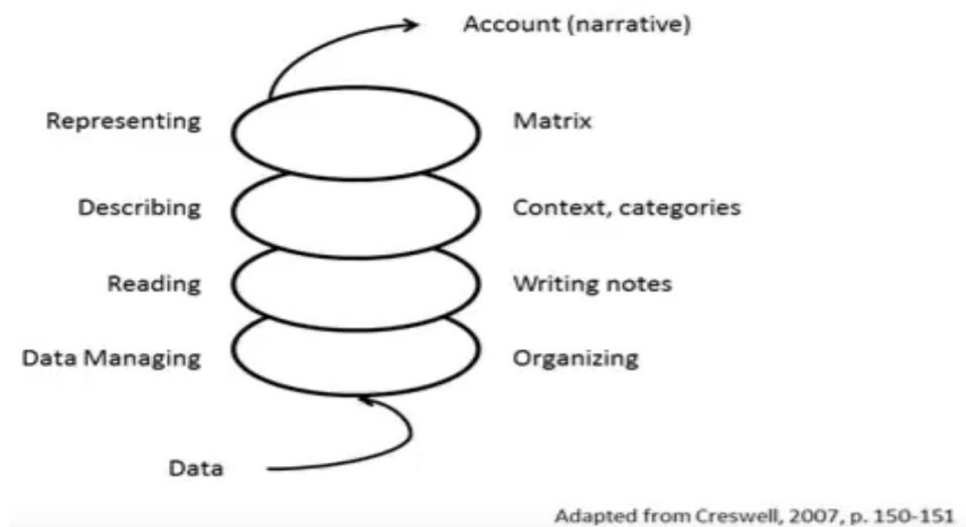
Figure 3. Creswell's (2007b) data analysis spiral.

Focus Group Participants

A total of 59 graduate students expressed interest in participating in the focus group portion of the study. The researcher sent out two group emails to these students after being notified of their interest to participate in the focus group discussion from their online survey responses. The group emails outlined the focus group confidentiality agreement and the timetable of the focus group schedules. Out of the initial 59 students, 17 confirmed that they would participate in the focus group. Of these 17 students, seven were in the Psychology program; two were in English; two were in Social Work; and one student was in each of Sociology, Political Science, Visual Arts, Film & Media Arts, Philosophy, and History. The focus group sign-in timetable offered five sessions, including three mornings and two afternoon sessions. The timetable was sent to all of the students who were willing to join the second part of study in order to secure higher focus-group participation.

Krueger and Casey (2015) suggest that "the ideal size of a focus group for most noncommercial topics is 5 to 8 participants" (p. 82). They recommend avoiding "focus groups with more than 10 participants because large groups are difficult to control, and they limit each person's opportunity to share insights and observations" (p. 82). Most participants in this study selected the morning sessions for their focus groups; however, two participants chose afternoon sessions. The researcher then emailed the latter participants and asked them if they would be willing to change their respective schedules in order to attend the morning sessions instead, and both participants voluntarily switched from an afternoon to a morning session. Ultimately, the focus groups were implemented with an ideal size: two groups were comprised of six students, and one group was comprised of five students. These focus group numbers were consistent with the numbers recommended by Krueger and Casey.

Focus Group Data Collection Process

The researcher encouraged participants in the focus-group discussion to respond to questions relating to information literacy skills. Each focus group discussion was video recorded and lasted one hour, which included 40 minutes of scheduled questions by the researcher, followed by a 20-minute conversation about library-related services and a pizza lunch. A video recording of the focus group was made, and in case there were any issues with the video's audio track, an additional audio recording was made. The researcher likewise took notes to record some of the information that audio recordings could not capture and in case either of the recordings malfunctioned. This ensured there would be some record of the focus group if there were any complications with the

equipment. Fortunately, the equipment worked perfectly and recorded the focus groups as originally intended.

The researcher transcribed the focus-group recordings using two computers: one computer held the encrypted video and audio recordings of the three focus groups, while a second computer was used to type out the transcriptions into a Microsoft Word document. All of the transcription documents were encrypted. During the transcription process, the researcher removed all participant identifiers and assigned each participant a randomized code name to protect the participants' privacy and preserve the research confidentiality agreement. Because the duration of each focus group was 45 minutes to 1 hour, it required between 6 to 8 hours of transcription. The transcriptions for each interview contain total running times, as well as constant time checks to make it easier to later navigate through the information. At times, the speakers would mumble and/or speak over each other, which made it difficult to understand every word. During such occasions, the tape was stopped and replayed until the words could be accurately discerned or were highlighted for later clarification. This process also allowed for voices to be distinguished and for better understanding of participants' physical gestures.

After completing the focus-group transcriptions, the researcher analyzed the qualitative research results. NVivo software was used to analyze the content of the focus-group interviews because it is designed to assist with unstructured, non-numeric data that supports qualitative and mixed methods research. Moreover, NVivo was "developed by researchers, with extensive researcher feedback, and [it] was designed to support researchers in the varied ways that work with data" (Bazeley, 2007, p. 2). NVivo also helps manage, query, graphically model, and report from the data (Bazeley, 2007); as

such, NVivo helped the researcher analyze and manage the focus groups' open-ended responses. The same meaning of the responses was coded to each category. NVivo's functions—such as word tree, word frequency query, and preferred method node matrix—helped to organize the results and discover connections and insights in the focus-group data more efficiently.

During the focus group sessions, the researcher led the group meeting and two librarians helped the researcher to set up the room, which included audio and video recording and the PowerPoint control. They also helped prepare food and beverages. The three focus groups took place within a week and were held in the Library West Building, Room 302.

During the focus groups, each of the students eagerly answered all the questions from the "Focus Group Guide for the Graduate Students (see Appendix D)." The focus-group participants' answers highlighted some of the information-literacy issues they experienced. At the end of the focus-group session, the students also asked additional questions related to information-literacy issues.

The researcher also provided refreshments—pizza, fruit, and beverages—at each focus-group session. As with the online survey, the researcher also prepared a draw for bookstore gift cards. The researcher again used a "Random Number Generator" to randomly pick some participants' numbers within the name list; six students won bookstore gift cards, which they later picked up in the researcher's office.

Member Checking

Lincoln and Gruba (1985) describe member checking as a research phase during which "the provisional report (case) is taken back to the site and subjected to the scrutiny

of the persons who provided information" (Lincoln & Guba, 1985, p. 236). Member

checking helped ensure that the collected data accurately represented the participants'

perspective of their information-literacy skills. Three emails were received from focus

group participants regarding member checking: one email asked a question about the

library's electronic resources troubleshooting system; the second email positively

affirmed the results; and the third email confirmed that the summary of the focus-group

answers was accurate. The remainder of the students chose not to reply. The member-

checking email instructed the participants to email the researcher if they had any

questions, which again ensured that the focus-group results would be more credible.

Focus Group Results—Clean Up and Coding

At the beginning of the qualitative research results analysis, the researcher used

"classic analysis strategy" to analyze the data. The classic analysis strategy approach was

a "process that has been used in countless analysis projects. It allows the analyst to

identify themes and categorize results" (Dilshad & Latif, 2013, p. 151). When the focus

group finished, VeraCrypt was used to store and combine the data for transcription.

Focus group transcriptions were the first step for dealing with the focus group data. The

researcher used three distinct approaches to analyze the transcriptions to identify the

themes and categories results after the focus group transcription. It was important to use a

number of approaches as the participants answered the questions in many different ways.

The first approach was identifying the meaning of the students' thoughts. This

sounded like a basic concept; however, it was necessary for the researcher to understand

the participants' use of language because they often used ambiguous pronouns like "that"

and "it" during the focus group, and it became necessary to identify the meanings. For

example, in an instance where a student might say, "I preferred using that," the context suggested that they meant, "I preferred using electronic resources." Identifying the word meaning allowed the software that analyzed the focus group data to perform more efficiently.

The second approach was simply using the word processor to copy and paste students' answers to one file. Since there were 17 students within three focus group, each student's comment was grouped to an individual. This approach made tracing the sources of each quote through the same file format easier. Within the file, the questions and content were separated into two levels: the questions as Heading 1, and the content as Normal. This was achieved "by developing a coding system" that allowed the researcher "to identify each quote by group" (Dilshad & Latif, 2013, p. 155).

The third approach was to use NVivo as qualitative data analysis software. NVivo provides a place to organize, store, and retrieve the qualitative data. NVivo can work more efficiently, save time, and rigorously back up findings with evidence. NVivo can also import data from virtually any source – text, audio, video, emails, images, spreadsheets, online surveys, social and web content and more. With advanced data management, query and visualization tools, NVivo allows people to ask complex questions of qualitative data, allowing them to discover and identify critical insights (NVivo, 2018).

Each participant's answers had been artifact descripted to individual files. Thus, 17 files were uploaded to the sources as transcription documents. According to focus group questions (see Appendix D), there were seven nodes coded. Some nodes had sub-nodes. For instance, for the questions that were about the preferred method of accessing

resources, the sub-nodes were coded as "preferred both formats," "preferred electronic format," and "preferred print formats." NVivo helped the researcher to analyze and manage the date sets of the focus group transcription of the text. The NVivo results provided numeric characters and graphic charts.

Due to the nature of NVivo, several activities had to be completed before data analysis. Data coding was the first step of node organization. Depending on the focus group questions, there were two levels of nodes: the first level was composed of the seven focus group questions, which were broken down into two sections. The second level was the sub-node based on the focus group questions. Auto code was the second activation and was used for separating the seven focus group questions and putting the 17 participants' responses under each corresponding question's nodes. This helped the researcher code the students who shared the same opinion within the same nodes, making it possible to run the query for "matrix coding" and to obtain the qualitative data results as the numerical data and graphic charts.

Online Survey Instrumentation

The online survey instrument chosen for this study was the Beile Test of Information Literacy for Education (B-TILED; Beile O'Neil, 2005). B-TILED is a standards-based instrument for assessing information literacy levels. The survey questions used a closed-ended model.

B-TILED Questionnaire

With the support of the Institute for Information Literacy and Library Education, the B-TILED questionnaire was developed and adapted by Beile O'Neil (2005) from a 62-question survey: Project SAILS. Beile O'Neil reduced the number of questions to 22

by merging a set of educational technology standards called "NETS*T" with the Association of College & Research Libraries (ACRL) objectives (Beile O'Neil, 2005, p. 86). The B-TILED questionnaire has been used as a survey instrument by previous researchers in studies of information literacy, such as Cannon (2007), Magliaro (2011), and Robertson and Felicilda-Reynaldo (2015), the later administered a modified B-TILED questionnaire as part of information literacy skills testing with the Department of Nursing, Missouri State University. Finally, Amy J. Catalano's (2016) *Streamlining LIS Research: A Compendium of Tried and True Tests, Measurements, and Other Instruments* lists the B-TILED questionnaire as a helpful and valid tool for information literacy tests. Overall, the B-TILED questionnaire is a reliable survey instrument that has helped researchers successfully investigate information-literacy skills.

The survey used a Likert scale to measure participants' rating of their own researching abilities based on their agreement or disagreement with an array of statements, which were designed as a survey quiz that asked multiple choice questions to test participant knowledge. The psychometric properties of this test were reported using the K-R 20 coefficient, which measures internal consistency reliability (Beile O'Neil, 2005, p. 83). When used with the B-TILED survey, Beile O'Neil (2005) reported that the K-R 20 coefficient was .675; however, a review of the literature suggests that there was no agreement on what the appropriate value of this coefficient should be. Although values in the .800 and .900 range seem more appropriate, Clark and Watson (1995) argue that standards of significance changed. In fact, researchers who study information literacy specifically had varying acceptable values. For example, Cameron (2004) found that a

0.690 value was acceptable, while Gratch-Lindauer and Brown (2004) found that a 0.760 value was not acceptable. Therefore, it was difficult to pinpoint a definite significant value.

Modification of the Online Survey Questionnaire

The B-TILED questionnaire was established 13 years ago and was originally used to test Faculty of Education students' information literacy levels. However, library services have made efforts to help students for access electronic resources since the 1980s, and ACRL's information literacy *Framework* was released three years prior to the current study. Thus, the researcher modified the survey questionnaire in conjunction with the ACRL's *Framework* in order to conduct the online survey with FAHSS graduate students (see Appendix C). In addition, a few of the B-TILED questions applied strictly to an American context, so the researcher altered a few of the questions to fit the Canadian context and further focused all of Beile O'Neil's questions to reflect the library's specific collection and information literacy services. Although such alterations were made, all of the questions still contained their original wording, and the questions were categorized according to the original B-TILED survey.

Categories. The questionnaire divided the 36 questions into seven categories: demographic information, knowledge of library services, search strategy, knowledge of electronic resources, information literacy assessment, citation, and ethical considerations and copyright. The researcher used these seven categories to identify and measure FAHSS graduate students' knowledge of library services, skills for searching electronic sources, and knowledge for citation and copyright. This allowed the researcher to compare the responses of participants from various FAHSS departments to determine each discipline's specific research needs.

Modified questions. According to the ACRL's (2015b) *Information Literacy*

Framework for Higher Education, "information literacy is the set of integrated abilities

encompassing the reflective discovery of information, the understanding of how

information is produced and valued" (p. 3). The researcher modified some of the survey

questions (see Appendix A for the original questionnaire and Appendix B for the

modified version for this research) to determine FAHSS graduate students' needs with

respected to the discovery of information. These needs could include understanding the

library's services, such as databases and electronic journals subscriptions.

Questions 1 and 2 asked participants to indicate their gender and language.

Instead of giving restrictive options for answers—such as man/woman or

English/French/other—these two questions were intentionally followed by a blank line.

This allowed graduate students to provide their gender and languages without restrictions

in order to respect all gender identification and languages.

Question 5 asked about the students' enrolment status as graduate students. The

options were changed from "less than 1 year" to "one semester or less than 1 year." The

purpose of this change was to include graduate students at all stages of the graduate

degree process.

Question 6 combined two questions in the B-TILED regarding attendance at other

universities, and offered three options for answers: "No, I have never attended another

university"; "Yes, I finished my undergraduate degree at an institution other than the

University of Windsor"; and "Yes, but I transferred to the University of Windsor to finish

my undergraduate degree." This change addresses differences in information literacy

training outcomes that exist between the University of Windsor and other universities or colleges.

Questions 7, 8, and 9 inquired about the library's orientation and information literacy instruction session. The third answer was changed from "don't know" to "not aware of it." In fact, the library offers information literacy sessions each semester and announces them via the liaison librarians. Distinguishing between students' lack of awareness and not knowing about the services allowed both the researcher and the student participants to become more aware of the communication gap that exists between faculties/librarians and students. If students were "more aware" of the services provided, they would likely change their behaviour while researching to take advantage of the services provided by the library. This change made the answer option clearer.

In the "Search Strategy" category, the measurement scale for questions 11 and 12 changed the options from an even number (four options: excellent, above average, average, and below average) to an odd number (five options: excellent, above average, average, below average, and poor). The University of Wisconsin's (2008) evaluation outcomes explain that "an odd number of options allows people to select a middle option and an even number of forces respondents to take sides" (University of Wisconsin-Extension, 2008, p. 10-08). Using an odd number of options thus provides greater evidence about graduate students' information-literacy skills when using library resources for their research. Questions 14 and 15 were changed slightly to acknowledge that the survey participation encompassed students not from the Faculty of Education but rather the Faculty of Arts, Humanities, and Social Sciences. This change addressed the differences in the respective participant pools.

Some of the conceptual questions in the questionnaire—such as those present in numbers 17, 34, and 36—were changed to reflect Canadian terminology. For example, "freshmen" was changed to "first years"; "sophomores" to "second years"; and "fair use" to "fair dealing." The researcher made these changes to help students understand the survey questions in a Canadian context.

Finally, some of the journal titles, encyclopedias, and databases originally cited in questions 20 to 22, 24 to 26, and 29 to 31 in the B-TILED survey were used only as resources by the Faculty of Education. Thus, the researcher replaced these resources with materials used by and associated with the FAHSS disciplines. This change was made to ensure that participants from FAHSS programs were familiar with the materials and could easily identify the answers in the survey questions.

Additional questions. Some information was added in the "Demographic Information" category. In question 3, the researcher asked participants about the level of their graduate studies. Because this survey targeted FAHSS graduate students, their levels of graduate studies were indicated as "master" and "doctorate." They could also indicate whether they were full-time or part-time graduate students.

Question 4 asked participants about their program of study. Because of the targeted participant pool, the question's answer options were updated based on the FAHSS's department structure.

Question 10 was added and framed based on the library specialist's information literacy service and the library's troubleshooting system. This question sought to determine whether students were aware of and used this service.

Question 18 was added to replace B-TILED's question 16 (see Appendix A) using fairly synonymous terms regarding the terminology of First Nations. In order to focus on FAHSS graduate students, this additional question sought to expand upon FAHSS graduate students' research preferences.

Deleted questions. Three of the original survey questions in the B-TILED questionnaire were deleted from the updated survey questionnaire as they were not applicable for this survey. The omitted questions included: question 29, which asked about the participants' teaching level; question 30, which asked about student classification; and question 33, which asked about undergraduate studies.

Content Validity

Content validity refers to "the extent to which the questions on the instrument and the scores from these questions are representative of all the possible questions that a researcher could ask about the content or skills" (Creswell, 2007a, p. 172). Creswell notes that content validity ensures that experts could evaluate whether the items measure what they are supposed to measure (see also Huck, 2004). In order to achieve content validity for this study's questionnaire, the researcher solicited librarians' comments regarding questions used for the online survey. Some librarians were tested using the questionnaire, and revisions were made based on their comments. The researcher also obtained reviews of the survey instrument from the research committee. Additional revisions were made according to their reviews.

Focus Group Guide

Two sections of questions were used during focus groups to determine participants' information-seeking preferences and knowledge of the library's electronic resources. The researcher prepared these open-ended questions prior to the focus-group sessions; however, to obtain a deeper understanding of participants' information literacy issues and their experiences using the library's collection, the researcher also asked some follow-up questions during the discussion. These follow-up questions were not pre-planned and changed depending on participants' understanding of the library's integrated system and the library's troubleshooting systems.

To reflect the converging nature of the mixed method design in this study, some of the focus group questions were developed to provide in-depth information about participants' literature search experience that the survey was not able to cover. For instance, question 10 in the survey questionnaire asked whether participants had "used the troubleshooting system when they used the library's electronic resources": only seven respondents answered "yes", while most participants either confirmed that they did not use it or were not aware of it. In the focus-group discussion, the researcher thus identified the reason for answers to question 10. The focus-group sessions thus provided more comprehensive answers regarding problems students face when accessing online resources and the strategies they used to address such problems.

Data Analysis

When online survey data were obtained from FluidSurvey, invalid entries were cleaned up. Data were compiled into SPSS (version 24) for descriptive and inferential analysis. The qualitative data were analyzed through NVivo software. This research

follows a qualitative coding strategy to identify emerging themes (Coffey & Atkinson,

1996; Maxwell, 1996). Transcribed focus-group data were read and reread to identify the

recurring information, and a code book was created to organize data according to focus-

group questions and subquestions using Auto Coding in NVivo. Recurring data were

coded to identify potential themes and subthemes, while additional themes were created

to categorize any useful information that may not be directly related to the research

questions. The analysis of both quantitative and qualitative data is illustrated in Figure 4.
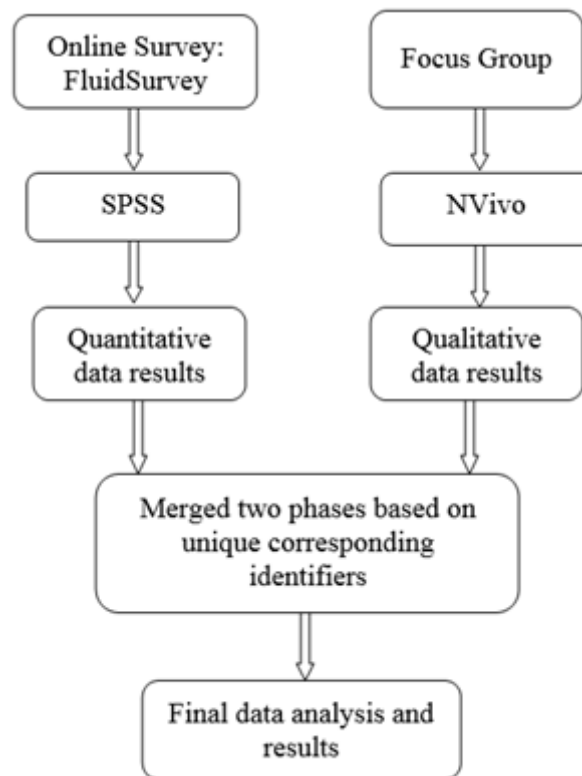
Figure 4. Convergent parallel mixed methods of the study.

Ethical Considerations

Ethical considerations are an integral component when conducting research

(Creswell, 2008); thus the study adopted specific ethical practices. For example, the

researcher obtained formal consent and permission from each participant, and also

maintained sensitivity for wording or phrases in the online survey questionnaire and the

Focus Group Guide so as to not harm participants in any way. The University of Windsor

Research Ethics Board granted approval on November 23, 2016, prior to commencing the

formal study.

CHAPTER 5

SURVEY RESULTS

In the following two chapters, the researcher will report the study results. This chapter will report survey results. Chapter 6 will report the data and findings from focus group discussion.

Online Survey Data Coding

The first two questions of the survey asked participants to write down their gender and the language spoken at home. Participants' responses varied. For the gender question, participants wrote down several answers other than man and woman: "CIS gendered woman," "Trans non-binary," "Fem presenting," and "N/A." Before uploading the online survey results to the SPSS, participants' responses were grouped into three categories: woman, man, and other. Likewise, the answers to the question "which language(s) you normally speak at home" were grouped into six responses: Chinese, Chinese/English, English, English/Cantonese, Serbian/English, and other language(s) and language combinations. This categorization was based on the language's rate of occurrence in SPSS results: languages that appeared more than three times were considered to be individual languages, the remaining languages were deemed to be "other language(s)". The rest of the demographic questions were designed as multiple choice and answers did not need to be changed from the original B-TILED questionnaire. The data for "program of study" were adjusted in accordance with the University of Windsor's website and FAHSS department ownership. For example, Criminology belonged to The Department of Sociology, Anthropology & Criminology, and Visual Arts is called The School of Creative Arts.

SPSS requires variables to be transformed to a numeric variable before any analysis. After the data were cleared up for demographic questions, the demographic respondents were coded as a sequential number. For gender (question 1), woman was coded as 1, man as 2, and other genders as 3. For language spoken at home (in question 2), Chinese was coded as 1, Chinese/English as 2, English as 3, English/Cantonese as 4, Serbian/English as 5, and other language(s) and language combinations as 6. For graduate status (question 3), master's was coded as 1, and doctorate was coded as 2. Similarly, program of study (question 4) was coded from 1 to 9. The questions concerning enrollment and alternative university attendance and all of other demographic questions were also coded depending on the number of options. In the categories of search strategy, knowledge of electronic resources, information literacy assessment, citation, and ethical considerations and copyright, there were multiple-choice sections. Each question had only one correct answer. Thus, correct answers from the quiz section (questions 13 to 36) were coded as 1, and incorrect answers were coded as 0.

There are six groups for calculating average values of the variables belonging to the same category. Since questions 11 and 12 evaluated graduate students' ability to search library databases by themselves, and these were subjective questions, the options of the 5-point Likert scale questions were coded from numbers 1 to 5: (1) excellent, (2) above average, (3) average, (4) below average, and (5) poor. The two questions from the quiz, 11 and 12, were subjective self-assessment and were grouped to one variable. The remaining categories kept the same category name with an underscore between words of the names: Search Strategy, Knowledge of Electronic Resources, Information Literacy Assessment, Citation, and Ethical Considerations Copyright. In terms of calculating the total score for correct answers, Compute Variable was used to determine the sum data for

each category, and the sum data for correct answers in each category were titled Search

Strategy Sum, Knowledge of Electronic Resources Sum, Information Literacy

Assessment Sum, Citation Sum, and Ethical Considerations Copyright Sum. The purpose

of creating the categories for the correct answers' sum was to be able to measure and

compare the demographic data from questions 1 to 6 with information literacy skills data

from questions 13 to 36.

Demographic Information

Demographic statistics are useful with respect to describing the basic features of

online survey data, such as the summary statistics for the scale variables and measures of

the online survey data. According to descriptive statistics analyses (Table 4) for the

question of gender, 74.6% of participants identified as a woman, 20.5% as a man, and

4.9% did not indicate either man or woman. With respect to language, there were six

categories: 67.2% of participants indicated they spoke English-only at home; 9.9% spoke

English and another language at home; and 23% did not speak English at all at home. In

terms of graduate status, 78.7% of participants were master's degree students and 21.3%

were Ph.D. students.

Table 4

Descriptive Statistics for Demographic Information Category (n=122)

Demographic information	Higher response	%
Gender	Female	74.6
Language(s) Speak at Home	English only	67.2
Graduate Status	Master	78.7
Program of Study	Social Work	33.1

Table 5 details the program distribution of participants. The Department of Psychology and the School of Social Work have larger enrollment of graduate students. The participation numbers from these departments were higher than the subject areas, with 29.8% in the Department of Psychology and 33.1% in the School of Social Work.

Table 5

Descriptive Statistics for Departmental Cluster (n=121)

Department	Graduate status	%
Communication, Media & Film	MA	5.8
Creative Arts	MA	1.7
English Language & Literature	MA / PhD	7.4
History	MA	7.4
Philosophy	MA	0.8
Political Science	MA	5.0
Psychology	MA / PhD	29.8
Social Work	MSW	33.1
Sociology and Anthropology	MA / PhD	9.1

Questions 5 and 6 were designed to obtain the information of graduate students' length of study in the University. These two questions included the years and length of study at the university and information on attendance at other universities or colleges. The researcher expected to find a relationship between the enrollment and information literacy skills. With respect to question 5, 36.9% of participants had been studied for one semester or less than one year and 9.8% had been enrolled for three to four years. Question 7 addressed where participants had earned their undergraduate degree: 67.8% of

participants finished their undergraduate degree at an institution other than the University

of Windsor. The details for this information are illustrated in Tables 6 and 7.

Table 6

Information of Length of Study in the University (n=122)

Question	Answer	%
How long have you been continuously enrolled at University of Windsor as a graduate student?	1 to 2 years	31.1
	3 to 4 years	9.8
	More than 4 years	22.1
	One semester or less than 1 year	36.9

Table 7

Attend Another University (n=121)

Question	Answer	%
Have you ever attended another university or college?	No, I have never attended another university	28.1
	Yes, I finished my undergraduate degree at an institution other than the University of Windsor	67.8
	Yes, but I transferred to the University of Windsor to finish my undergraduate degree	4.1

As shown in Table 6, 36.9% was the highest number for participants who studied

at the university for only one semester or less than 1 year, starting either in the fall 2016

or winter 2017. As shown in Table 7, 67.8% of participants transferred to the university.

Knowledge of Library Services

To measure the library's awareness of information literacy training, questions 7 to

10 explored whether the graduate students attended any information literacy training

sessions when they began their studies at the university. Results show that 55.5% of

participants said that they had not attended the library's orientation, while 9.2% said they

were not even aware of the orientation. Moreover, 58.5% had attended a library

instruction session, while 7.6% said they were not aware of this session. However, with

respect to one-on-one intensive instruction, 73.7% of participants had not had such

sessions, and 6.8% of them were not aware of having received information for such

training. Furthermore, regarding the troubleshooting system, only 5.9% of participants

used the service to report problems they were experiencing while doing research, while

94.1% of them either did not use or were not aware of it (Table 8). Combining these four

questions, on average 57.1% of participants did not use various library services, 13%

were not award of them, and 29.9% used them.

Table 8

Knowledge of Library Services (n=122)

	Responses (%)		
Questions	No	Not aware of it	Yes
Have you attended an orientation of the library?	55.5	9.2	35.5
Have you attended a library instruction session held in your classroom?	33.9	7.6	58.5
Have you had one on one intensive organized instruction with a librarian?	73.7	6.8	19.5
Have you used the troubleshooting system (e.g. elecprod@uwindsor.ca) when you use the library's electronic resources?	65.5	28.6	5.9

Self-assessment of Search Strategy

Questions 11 and 12 were 5-point Likert scale of self-assessment questions regarding the ability to search the library's database and the Internet for information within the category of "search strategy." More than 59.8% of the participants rated themselves as above average or excellent for searching the library's database, and more than 74% of participants rated themselves as above average or excellent for searching the Internet for information (Table 9). Participants were overall much more confident with their internet search ability than library databases.

Table 9

Search Strategy Self-Assessment (n=112)

	Responses (%)				
Questions	Excellent	Above average	Average	Below average	Poor
Overall, how would you rate your ability to search the library database to find information?	9.8	50.0	36.6	1.8	1.8
Overall, how would you rate your ability to search the Internet to find information?	21.4	52.7	24.1	1.8	0.0

Descriptive Statistics of Five Aspects of Information Literacy

The total scores were calculated in order to determine the percentage of correct answers for questions 13 to 36 (Table 10). The minimum number of correct answers was 0, and the maximum number of correct answers was 22 (out of 24). The Mean and Standard Deviation are M=13.616, SD=4.861. A fairly normal distribution was noted with a negative Skewness of -.848. The percentage of correct scores was 56.73% (%

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score = M/Total Number of Questions, 13.616/24=56.73%). According to Beile O'Neil's (2005) study, "test takers needed to achieve a score of 57.5% to be considered acceptably competent" (p. 124). Cannon (2007) also used 57.5% as "to be considered acceptably competent in information literacy knowledge" (p. 79) for urban graduate students. These data confirmed that participants on average were not competent with information literacy skills.

Table 10

Descriptive Statistics of B-TILED Scores (n=112)

Descriptive Measure	Value
Mean	13.616
Std. Deviation	4.861
Variance	23.626
Skewness	-0.848
Std. Error of Skewness	0.228
Kurtosis	-0.005
Std. Error of Kurtosis	0.453
Minimum	0.000
Maximum	22.000

Search Strategy

Questions 13 to 21 encompassed the category of search strategy, which related to obtaining information by using information literacy skills and research techniques. This category addressed some of the search strategies, such as Boolean searches—a searching technique that allows users to combine words and phrases using the words AND, OR, and NOT—as well as other advanced fields, such as keyword search, related terms, and truncation. The response rates to the nine questions were as follows (Table 11): 2

students (1.8%) answered all nine questions correctly; 27 students (24.3%) answered five

questions correctly; and 40 students (36%) answered only four or fewer of these

questions correctly. The Mean value from the frequency results for this question was 4.93.

In particular, question 17 tested whether students understood that there can be more than

one search term to describe the same concept. The example given in this particular

question reflected on the terminology of "college students", mainly to express the idea

that there could be differences between the Canadian term versus the American term.

Although "college students" seems to be mainly understood as an American term to

describe "university students", Canadian students use the term 'college student' to

represent those who attend non-university post-secondary institutions. Understanding this

terminology may increase the recall ratio when students conduct research. However, the

results showed that most of the participants did not understand the meaning of the

American term for "college students". Thus, only 14 students (12.8%) answered the

question correctly for the concept "college students", 97 participants (87%) answered the

question incorrectly, and 13 participants did not answer this question. The rate of all

correct answers in this category of nine questions was 1.8%, which was lower compared

to other categories.

Table 11

Correct Answers for Search Strategy

Question no.	Correct answer	Total no. responses	% of correct answers
Q13	Search multiple terms by field	111	45.9
Q14	Professional conferences and journal articles	110	81.8
Q15	Search an arts, humanities and social sciences database for journal articles	110	42.7
Q16	Drug therapy, health risks, hyperactivity	109	61.5
Q17	Graduate students, first years, second years…	109	12.8
Q18	First Nations or Indigenous or Native Americans	110	70.0
Q19	Read, reader, reads, readmit	109	78.0
Q20	Add "student learning" as a keyword	108	75.9
Q21	A subject-specific encyclopedia, such as *Encyclopedia of Psychology*	107	22.4

Knowledge of Electronic Resources

The category of knowledge of electronic resources encompassed questions 22 to 24. These questions tested participants' knowledge of electronic resources, such as understanding scholarly research. The participants were quite familiar with databases, electronic journals, and electronic books, which were found in the library's electronic subscription collections and could be accessed through Primo. The response rates to the questions were as follows: 57 students (54.8%) answered three questions correctly; 37 students (35.6%) answered two questions correctly; 10 students (9.6%) answered one question or less correctly; and 18 students skipped all three questions. The Mean value for this category as correct answers was 2.4, and 54.8% of the questions were answered correctly. Regarding question 24, 95 students chose the correct answer, which was the

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highest correct answer rate within the six categories. The rate of the correct answer in this category with three questions was higher compared to other categories. This result may indicate that graduate students in FAHSS had some training in scholarly research. Results for this category are illustrated in Table 12.

Table 12

Correct Answers for Knowledge of Electronic Resources

Question no.	Correct answer	Total no. responses	% of correct answers
Q22	Reviewed by experts for publication	104	78.8
Q23	Relevant subject matter	103	74.8
Q24	Journals, reviews, and articles relating to the humanities, social sciences and literature; includes back issues	104	91.3

Information Literacy Assessment

The category of information literacy assessment encompassed questions 25 to 27, which were concerned with participants' in-depth understanding of the specifics of journals, databases, and content related to the FAHSS subject areas. The response rates to the questions, outlined in Table 13, were as follows: 5 students (5.1%) answered all three questions correctly, 82 students (83.7%) answered one or two questions correctly, 13 students did not answer the three questions, and 24 students skipped all three questions. The Mean value for this category as correct answers was 1.38. With respect to question 25, only 13 students chose the correct answer, which was the lowest correct answer rate within these six categories. This question tested participants' understanding of scholarly

research databases. This result conflicted with results in question 22 (82 correct answers), demonstrating that participants' information literacy skills were inconsistent.

Table 13

Correct Answers for Information Literacy Assessment

Question no.	Correct answer	Total no. responses	% of correct answers
Q25	Toronto Sun article from July 2015 describing one of the protests	98	13.3
Q26	Literature online	97	78.4
Q27	The table of contents lists a chapter on your topics	98	46.9

Citation

Questions 28 to 32 comprised the citation category. This category was designed to test graduate students' knowledge of bibliographic entries and the information sources they used in their research. The response rates to the questions, outlined in Table 14, were as follows: 24 students (25.0%) answered all of the questions correctly, 39 students (40.6%) answered four questions correctly, and 33 students (34.4%) only answered three or fewer questions correctly. The Mean value for this category as correct answers was 3.67. These questions sought to identify participants' ability to identify a citation as a chapter in a book and a conference paper citation from a database. The results for this category showed that more than 80% of participants have some citation skills; however, the result for question 31 was low. The questions in this category represent the basic information literacy skills that are required by the ACRL's information literacy

Framework (2015b), which graduate students would benefit from while completing their respective degrees.

Table 14

Correct Answers for Citation

Question no.	Correct answer	Total no. responses	% of correct answers
Q28	A chapter in a book	95	82.1
Q29	Article title search: Explaining environmental behaviour across borders: A meta-analysis	96	87.5
Q30	A conference paper	96	84.4
Q31	You decide to investigate the reputation of the publisher by looking at another website	96	35.4
Q32	To address these issues, Hunter has proposed that students work in groups with the computer peripheral to the group and the teacher acting as facilitator	96	78.1

Ethical Considerations & Copyright

This category covered questions 33 to 36 (Table 15). It included the concept of giving credit to authors and obtaining permission from the copyright holder. Of the participants, 15 students (15.6%) answered all of the questions correctly, 34 students (35.4%) answered three questions correctly, 32 students (33.3%) answered two questions correctly, and 11 students (11.5%) answered one question correctly. The Mean value for this category as correct answers was 2.47. It is worth mentioning that question 36—fair dealing policy implemented in the university since March 2010—refers primarily to the copying of paper and electronic documents by university faculty and staff (Leddy Library,

2012), so students should be aware of it for their research; however, only 29.5% of

participants responded to this question correctly.

Table 15

Correct Answers for Ethical Considerations & Copyright

Question no.	Correct answer	Total no. responses	% of correct answers
Q33	Only when you give them credit	96	88.5
Q34	Permission is not needed as the report is openly available from the government agency's website	96	49.0
Q35	No, because this action constitutes a violation of copyright	94	81.9
Q36	Fair dealing	95	29.5

One-Way Analysis of Variance Results

Analysis of variance (ANOVA) is a method that allows the researcher to compare

the Mean score of a continuous variable between numbers of groups. In this study,

ANOVA were performed to determine "whether means on a dependent variable are

significantly different among groups" (Green & Salkind, 2014, p. 164). Twenty-five

ANOVA analyses, five two sample T Test, and seven multiple comparisons were

performed. They used gender, language, level of graduate status, program of study,

length of study in the university, and attendance at another university/college as the

independent variables to test the group means for Search Strategy, Knowledge of

Electronic Resources, Information Literacy Assessment, Citation, and Ethical

Considerations & Copyright. These variables are each assessed separately against the

categories above. In this analysis, there was one observation in the group for language

and one observation for program of study: speaks English and Cantonese for the language variable, and "philosophy" in program of study. Therefore, it was ignored in this case for this analysis.

ANOVA Analysis for Gender

The first analysis (Table 16) looked at the relationship between Gender and Search Strategy, Knowledge of Electronic Resources, Information Literacy Assessment, Citation, and Ethical Considerations & Copyright. The results showed that there was no significant difference in the skills above among different genders. This analysis shows that learning information literacy skills is not dependent on gender.

Table 16

ANOVA Results for Gender

Category		Sum of squares	df	Mean square	F	Sig.
Search strategy	Between groups	.163	2	.081	1.963	.146
	Within groups	4.437	107	.041		
	Total	4.600	109			
Knowledge of electronic resources	Between groups	.010	2	.005	.099	.906
	Within groups	5.036	99	.051		
	Total	5.046	101			
Information literacy assessment	Between groups	.183	2	.092	1.465	.236
	Within groups	5.936	95	.062		
	Total	6.119	97			
Citation	Between groups	.298	2	.149	2.619	.078
	Within groups	5.239	92	.057		
	Total	5.537	94			
Ethical considerations copyright	Between groups	.246	2	.123	1.181	.168
	Within groups	6.238	92	.068		
	Total	6.484	94			

ANOVA Analysis for Language

The second tested the language group means for Search Strategy, Knowledge of Electronic Resources, Information Literacy Assessment, Citation, and Ethical Considerations & Copyright. As illustrated in Table 17, they were equal; however, Search Strategy skills varied for the five language groups (Chinese—M=0.444, SD=0.190; Chinese&English—M=0.35, SD=0.190; English – M=0.612, SD=0.186; Other—M=0.389, SD=0.204; Sebian&English—M=0.555, SD=0.128). At an alpha of 0.05, the analysis indicated Search Strategy as statistically significant difference among the groups, $F(4,105) = 6.556$, $p = .000$. "Citation" skills also are different among the five language groups: Chinese—M=0.554, SD=0.260; Chinese&English—M=0.550, SD=0.443; English—M=0.771, SD=0.204; Othe—M=0.840, SD=0.245; Sebian&English—M=0.700, SD=0.258. The analysis indicates a statistically significant difference among the groups: $F(4,90) = 3.590$, $p = .009$. With regard to Ethical Considerations & Copyright, skills varied for the five language groups: Chinese—M=0.385, SD=0.242; Chinese&English—M=0.375, SD=0.250; English—M=0.699, SD=0.219; Other—M=0.625, SD=0.294; Sebian&English—M=0.437, SD=0.315. The analysis indicates a statistically significant difference among the groups: $F(4,90) = 6.737$, $p = .000$. This analysis shows that language may impact information literacy skills.

Table 17

ANOVA Results for Language Speak at Home

Category		Sum of squares	df	Mean square	F	Sig.
Search strategy	Between groups	.919	4	.230	6.556	.000
	Within groups	3.681	105	.035		
	Total	4.600	109			
Knowledge of electronic resources	Between groups	.431	4	.108	2.268	.067
	Within groups	4.614	97	.048		
	Total	5.046	101			
Information literacy assessment	Between groups	.192	5	.038	.597	.702
	Within groups	5.927	92	.064		
	Total	6.119	97			
Citation	Between groups	.762	4	.190	3.590	.009
	Within groups	4.775	90	.053		
	Total	5.537	94			
Ethical considerations copyright	Between groups	1.494	4	.374	6.737	.000
	Within groups	4.990	90	.055		
	Total	6.484	94			

Further, Post Hoc (Bonferroni) was applied to confirm where the differences

occurred between groups. The test results illustrate that when the participants' first

language is English (M=0.612, SD=0.186), their Search Strategy skills were significantly

higher than the participants whose first language as Chinese (M=0.444, SD=0.190). The

Mean difference in this context was 0.168*, *p*= .026. Additionally, the analysis indicates

that participants who identified English as their first language (M=0.612, SD=0.186)

provided answers that that suggest their Search Strategy skills were significantly higher

than the participants who identified their first language as "Other languages" (M=0.390,

SD=0.204). These showed a mean difference of 0.223*, *p=*. 002. No two other language groups surveyed were significantly different from one another.

Other Post Hoc (Bonferrioni) tests were applied to confirm where the differences occurred between groups for the Citation category. The results showed that for participants whose first language is English (M=0.771, SD=0.204), their response suggested that their Citation knowledge was significantly higher than the participants whose first language is Chinese (M=0.554, SD=0.260). The Mean difference between the two was 0.217*, *p=*.026. Moreover, when participants cited their language as "Other" (M=0.840, SD=0.246), their response suggested that their Citation knowledge was significantly higher than those who cited their first language as Chinese (M=0.554, SD=0.260). The Mean difference between them was 0.286*, *p=*.040. No two other groups were significantly different from one another.

Again, the Post Hoc (Bonferroni) test was applied to confirm where the differences occurred between groups for the categories Ethical Considerations & Copyright. The results showed that when the participants' first language is English (M=0.699, SD=0.219), their rate of correct responses to the Ethical Considerations & Copyright question was significantly higher than the participants whose first language is Chinese (M=0.385, SD=0.242) and the Mean difference is 0.315*, *p=.000*.

T Test for Graduate Status

Thirdly, the Means of the level of Graduate Status on Search Strategy, Knowledge of Electronic Resources, Information Literacy Assessment, Citation, and Ethical Considerations & Copyright was tested (Table 18).

Table 18

Levene's Test for Graduate Status

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Search Strategy	Equal variances assumed	6.241	0.014	3.673	109	0.000	0.163	0.044	0.075	0.251
	Equal variances not assumed			4.460	60	0.000	0.163	0.037	0.090	0.236
Knowledge of Electronic Resources	Equal variances assumed	2.348	0.129	1.283	102	0.203	0.067	0.052	-0.037	0.171
	Equal variances not assumed			1.431	49	0.159	0.067	0.047	-0.027	0.161
Information Literacy Assessment	Equal variances assumed	1.294	0.258	0.864	96	0.390	0.053	0.061	-0.068	0.173
	Equal variances not assumed			0.785	30	0.438	0.053	0.067	-0.084	0.189
Citation	Equal variances assumed	2.053	0.155	2.291	94	0.024	0.132	0.057	0.018	0.246
	Equal variances not assumed			2.817	51	0.007	0.132	0.047	0.038	0.225
Ethical Considerations & Copyright	Equal variances assumed	3.450	0.066	1.639	94	0.105	0.103	0.063	-0.022	0.228
	Equal variances not assumed			1.946	47	0.058	0.103	0.053	-0.003	0.210

Since only two groups (Master and Doctorate) were used for level of graduate status, a T

test was applied in Table 18. For Search Strategy, Levene's Test shows equal variance

assumption is violated. The test result indicate that Doctorate students' Search Strategy skills (M=0.677, SD=0.145) are significantly higher than Master students (M=0.517, SD=0.208) with t(60) = 4.460, p = 0.000). With regard to Knowledge of Electronic Resource, Levene's Test shows equal variance assumption is satisfied. The test result indicate that there is no significant difference between Doctorate students (M=0.867, SD=0.192) and Master students (M=0.810, SD=0.232) in this category: t(102) = 1.283, p = 0.203. With respect to Information Literacy Assessment, Levene's Test shows equal variance assumption is satisfied. The test result indicate that there is no significant difference between Doctorate students and Master students in this category with t(96) = 0.864, p = 0.390. For Citation, Levene's Test shows equal variance assumption is satisfied. The test result indicate that Doctorate students' (M=0.836, SD=0.171) citation skills are significantly higher than Master students' skills (M=0.706, SD=0.254) with t(94) = 2.291, p = 0.024. When applied to Ethical Considerations & Copyright, Levene's Test suggests that equal variance assumption is satisfied. The test result indicate that there is no significant difference between Doctorate students and Master students in this category with t(94) = 1.639, p = 0.105.

ANOVA Analysis for Program of Study

Next, the analysis tested whether Program of Study had effected on Search Strategy, Knowledge of Electronic Resources, Information Literacy Assessment, Citation, and Ethical Considerations & Copyright (Table 19). The results indicate that there were statistically significant differences between the program of study for Search Strategy (Communication, Media & Film—M=0.352, SD=0.285; Creative Arts – M=0.278, SD=0.079; English Language & Literature – M=0.556, SD=0.215; History – M=0.493,

SD=0.217; Political Science – M=0.500, SD=0.111; Psychology – M=0.686, SD=0.174;

Social Work – M=0.519, SD=0.173; Sociology & Anthropology – M=0.467, SD=0.164).

In this context, $F(8,100) = 4.328$, $p = .000$). Citation skills also varied based on program

studies: Communication, Media & Film—M=0.600, SD=0.316; Creative Arts – M=0.400,

SD=0.283; English Language & Literature – M=0.675, SD=0.320; History – M=0.800,

SD=0.000; Political Science – M=0.533, SD=0.306; Psychology – M=0.817, SD=0.172;

Social Work – M=0.779, SD=0.191; Sociology & Anthropology – M=0.556, SD=0.357.

The test result show there is statistically significant difference among program studies as

determined by $F(8,85) = 2.762$, $p = .009$.

Table 19

ANOVA Results for Program of Study

Category		Sum of squares	df	Mean square	F	Sig.
Search strategy	Between groups	1.180	8	.147	4.328	.000
	Within groups	3.408	100	.034		
	Total	4.588	108			
Knowledge of electronic resources	Between groups	.510	8	.064	1.300	.253
	Within groups	4.511	92	.049		
	Total	5.021	100			
Information literacy assessment	Between groups	.320	8	.040	.608	.769
	Within groups	5.783	88	.066		
	Total	6.103	96			
Citation	Between groups	1.119	8	.140	2.762	.009
	Within groups	4.304	85	.051		
	Total	5.423	93			
Ethical considerations copyright	Between groups	.660	8	.083	1.292	.259
	Within groups	5.431	85	.064		
	Total	6.091	93			

Further, Post Hoc (Bonferroni) was applied to confirm where the differences occurred between groups concerning the program of study. The results suggest that students who studied in the Department of Psychology (M=0.687, SD=0.174) had Search Strategy skills that were significantly higher than those of the students who studied in the Department of Communication, Media & Film (M=0.359, SD=0.285). The Mean difference between them was 0.334*, *p=.002*. Additionally, the analysis suggests that Search Strategy skills from the students in the Department of Psychology (M=0.686, SD=0.174) were significantly higher than the students in the School of Social Work (M=0.519, SD=0.173) and the Department of Sociology, Anthropology & Criminology (M=0.467, SD=0.164). The Mean differences were 0.1669*, *p= .008* and 0.219*, *p= .036* respectively. No two other groups were significantly different from one another.

The ANOVA test indicates that Program of Study was effected with significant differences regarding skills of Citation, but the Post Hoc from the Bonferroni test results was not significantly different. This may be due to the small sample size and low power when the Bonferroni test was employed. In this case a Bonferroni correction may be too conservative when comparing among the programs of study. In this circumstance, a Bonferroni correction cannot be used because it may cause the researcher to miss out on potential differences. Comparing groups without a correction is sometimes called the Least Significant Difference (LSD), and it was used in the research. In terms of the Citation skills, the results suggest that participants who studied in the Department of Psychology (M=0.817, SD=0.172) had significantly higher citation skills than the participants who studied in the Department of Communication, Media & Film (M=0.600, SD=0.316), the School of Creative Arts M=0.400, SD=0.283), the Department of

Political Science (M=0.533, SD=0.306), and the Department of Sociology, Anthology & Criminology (M=0.556, SD=0.357) by mean difference 0.217, 0.417, 0.284 and 0.262. Additionally, results suggest that the students in the Department of History (M=0.800, SD=0.00) had significantly higher citation skills than the students in the Department of Creative Art (M= 0.400, SD=0.283) and the Department of Sociology, Anthology & Criminology (M=0.556, SD=0.357). The Mean differences were 0.400 and 0.244. The School of Social Work (M=0.779, SD=0.191) students had significantly higher citation skills than the students in the School of Creative Arts (M=0.400, SD=0.283) and the Department of Sociology, Anthropology & Criminology (M=0.556, SD=0.357). The Mean difference was 0.379 and 0.223. Overall, the students in the Department of Psychology, the Department of History and the School of Social Work collectively had the highest correct response rates with regard to questions that considered citation skills.

ANOVA Analysis for Length of Study in the University

An analysis was also completed to determine whether length of study in the University effected Search Strategy, Knowledge of Electronic Resources, Information Literacy Assessment, Citation, and Ethical Considerations & Copyright (Table 20). The results indicated that there were statistically significant differences between the year of length of study for Search Strategy: 1 to 2 years—M=0.528, SD=0.203; 3 to 4 years—M=0.739, SD=0.190; more than 4 years—M=0.589, SD=0.194; one semester or less than 1 year—M=0.506, SD=0.196. Similar differences were seen with regard to Ethical Considerations & Copyright: 1 to 2 years—M=0.621, SD=0.251; 3 to 4 years—M=0.781, SD=0.248; more than 4 years—M=0.702, SD=0.245; one semester or less than 1 year—

M=0.531, SD=0.268. Both results were determined by the one-way ANOVA, $F(3,105) =$ 4.121, $p = .008$, $F(3,90) = 3.0792$, $p = .031$ respectively.

Table 20

ANOVA Results for Length of Study in the University

Category		Sum of squares	df	Mean square	F	Sig.
Search strategy	Between groups	.483	3	.161	4.121	.008
	Within groups	4.104	105	.039		
	Total	4.587	108			
Knowledge of electronic resources	Between groups	.275	3	.092	1.873	.139
	Within groups	4.740	97	.049		
	Total	5.014	100			
Information literacy assessment	Between groups	.335	3	.122	1.990	.121
	Within groups	5.754	94	.061		
	Total	6.119	97			
Citation	Between groups	.301	3	.100	1.749	.163
	Within groups	5.166	90	.057		
	Total	5.467	93			
Ethical considerations & copyright	Between groups	.602	3	.201	3.079	.031
	Within groups	5.866	90	.065		
	Total	6.468	93			

Post Hoc (Bonferroni) was also applied to confirm where the differences occurred between the lengths of study in the university. The results suggest that the students who were enrolled in 3-4 years at the university (M=0.739, SD=0.190) had better Search Strategy skills as their rate of correct responses were significantly higher than the students studied in 1 to 2 years (M=0.528, SD=0.203) and those who had been at the university for one semester or less than 1 year (M=0.506, SD=0.196). The Mean

difference was 0.211 and 0.233 respectively. No two other groups were significantly different from one another.

Again, the ANOVA test suggests there was a significant difference between length of study in the university and Ethical Considerations & Copyright, but the Post Hoc (Bonferroni) test from the Bonferroni did not, likely due to the small sample size and the conservative nature of the Bonferroni correction. Thus, the Bonferroni correction may not accurately highlight potential differences. The LSD test was applied again, and the test results suggest that the students who had studied for 3 to 4 years (M=0.781, SD=0.248) at the university had higher Ethical Consideration & Copyright skills than those students who had been at the university one semester or less than 1 year (M=0.531, SD=0.268) significantly. The Mean difference was 0.243. Likewise, the students who were enrolled more than 4 years (M=0.702, SD=0.245) at the University provided a significantly higher rate of correct answers with respect to question concerning Ethical Consideration & Copyright skills than those participants who had been at the University one semester or less than 1 year (M=0.531, SD=0.268).

ANOVA Analysis for Attended another University or College

Finally, the analysis looked at the relationship between the participants who attended another university or college with the categories as Search Strategy, Knowledge of Electronic Resources, Information Literacy Assessment, Citation, and Ethical Considerations & Copyright (Table 21). The results suggest that there were no significant differences with regard to students who had attended another university or college. This analysis shows that learning information literacy skills is not dependent on the university or college that the students chose to attend previously.

Table 21

ANOVA Results for Attended another University or College

Category		Sum of squares	df	Mean square	F	Sig.
Search strategy	Between groups	.181	2	.091	2.223	.113
	Within groups	4.316	106	.041		
	Total	4.497	108			
Knowledge of electronic resources	Between groups	.013	2	.006	.127	.881
	Within groups	5.001	98	.051		
	Total	5.014	100			
Information literacy assessment	Between groups	0.032	2	.016	.248	.781
	Within groups	6.087	95	.064		
	Total	6.119	97			
Citation	Between groups	.134	2	.067	1.137	.325
	Within groups	5.404	92	.059		
	Total	5.537	94			
Ethical considerations & copyright	Between groups	.156	2	.078	1.135	.326
	Within groups	6.328	92	.069		
	Total	6.484	94			

Correlation Analysis

The correlation analysis was conducted to investigate the relationship among five

categories of information literacy skills. Results are reported in Table 22. There was a

significantly positive correlation among categories Search Strategy, Knowledge of

Electronic Resources, Citation, and Ethical Considerations & Copyright. However,

Information Literacy Assessment was not correlated with any other categories. These

results indicated that there are four correlated categories. This means that if one of the

four categories were high, then the others were also high. However, this is exclusive to

the uncorrelated category Information Literacy Assessment.

Table 22

Pearson Correlations Results for Each Category

Category		Search Strategy	Knowledge of Electronic Resources	Information Literacy Assessment	Citation	Ethical Considerations & Copyright
Search Strategy	Pearson Correlation	1	.342[**]	0.070	.393[**]	.375[**]
	Sig. (2-tailed)		0.000	0.491	0.000	0.000
	N	111	103	98	96	96
Knowledge of Electronic Resources	Pearson Correlation	.342[**]	1	-0.020	.427[**]	.239[*]
	Sig. (2-tailed)	0.000		0.847	0.000	0.019
	N	103	104	98	96	96
Information Literacy Assessment	Pearson Correlation	0.070	-0.020	1	0.060	-0.068
	Sig. (2-tailed)	0.491	0.847		0.562	0.513
	N	98	98	98	96	96
Citation	Pearson Correlation	.393[**]	.427[**]	0.060	1	.467[**]
	Sig. (2-tailed)	0.000	0.000	0.562		0.000
	N	96	96	96	96	96
Ethical Considerations & Copyright	Pearson Correlation	.375[**]	.239[*]	-0.068	.467[**]	1
	Sig. (2-tailed)	0.000	0.019	0.513	0.000	
	N	96	96	96	96	96

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Summary of Survey Findings

Survey results indicate that the average percentage of correction answer was 56.5% though the correct answers for each category varies (Table 23). The number of participants who answered questions correctly for each category was very low outside of knowledge related to electronic resources (Table 24) and citation. On averages, participants were not competent in information literacy skills. They perform better in their knowledge about electronic resources and citation than other areas, such as

information literacy assessment and search strategy. There was a quite significant space left for improvement in their overall information literacy skills.

The One-Way ANOVA analysis suggests that learning information literacy skills was not dependent on any demographics, such as gender and university or college attended. A good command of information literacy skills, however, was dependent on the English language proficiency. Furthermore, Doctorate students performed better on the information literacy skills question than did Master students, and students who had been continuously studying for 3 to 4 years in university offered responses that suggested they knew more about information retrieval and citing information correctly that students who had been in school for a shorter period of time. Likewise, graduate students from the faculties of Psychology, History and Social Work collectively had the highest scores with regard to citation skills.

The correlation analysis results suggest that Information Literacy Assessment was not correlated with any of the other four categories, though each of the other four categories were highly correlated with each other.

Table 23

Descriptive Statistics of Correct Responses for Each Category

Category (Standardized)	Total no. responses	Minimum statistic (scaled)	Maximum statistic (scaled)	Mean statistic (scaled)	Std. Deviation (scaled)
Search strategy	111	.00	1.00	0.55	0.21
Knowledge of electronic resources	104	.00	1.00	0.82	0.23
Information literacy assessment	98	.00	1.00	0.46	0.25
Citation	96	.00	1.00	0.73	0.24
Ethical considerations copyright	96	.00	1.00	0.63	0.26

Table 24

Frequency for Number of Participants Who Answered all Questions Correctly for Each

Category

Category	Total no. responses	Total no. participants who answered the all questions correctly	% of total participants who answered the all questions correctly
Search strategy	111	2	1.8
Knowledge of electronic resources	104	57	54.8
Information literacy assessment	98	5	4.1
Citation	96	24	25.0
Ethical considerations copyright	96	15	15.6

CHAPTER 6

FOCUS GROUP RESULTS

The focus group questions were focused on participants' information seeking preference and knowledge of the library's electronic resources. In this chapter, the researcher will report the study findings from focus group discussion.

Word Tree and Word Frequency Results

There were three associated key phrases: "preference of material format," "Google Scholar usages," and "awareness of the library troubleshooting services." Using NVivo to run a text search query obtained the overview of the graduate students' perspectives. All of the internal sources, which were the qualitative data loaded from the focus group transcriptions, were run using the keywords and the results. Word trees were then created to use the data from this search query. These word trees helped to identify the relationships around the three categories: "electronic AND print," "electronic," and "print".

The word tree (Figure 5) used a special function from NVivo called "AND." Since the words 'electronic' and 'print' were used frequently in this data set, the AND function was utilized to establish any potential correlations between the word "electronic" and "print". The NVivo results displayed from left to right highlight the relationship with the word electronic. These include comments like "some online access I will choose electronic," "university's website either looking for electronic journals, I would say like," and "the search options within, like electronic and print both." The word "print" appeared four times on both sides, while the word "electronic" and its related words—such as database, e-book, and electronic journal—appeared more often than print on both sides. These results indicate that graduate students paid more attention to

electronic resources than other materials when they did their research. Furthermore, the NVivo AND results displayed the words "electronic" and "print" respectively. For example, one of the participants said, "I usually end up using" (Figure 5 on left side) "electronic" (Figure 6 on the middle) "books in school at the…" (right hand side); one of other students says, "I would download it and" (Figure 5 on left side) "print" (Figure 5 on the middle) "it out, otherwise my eyes…" (Figure 5 on right side). These results demonstrated and illustrated the correlation between "electronic" and "print" when graduate students conducted their research. These results also indicated that the participants preferred using both formats for different purposes. Most participants began their research looking for electronic resources. When they found the items they were looking for, they would sometimes print out the items or download/bookmark them to the local storage. If an electronic format was not available, they used the print format as an alternative option. Some of the participants noted that they used print resources for particular reasons, such as eye health issues or the computer system issues. These results suggested that electronic resources play a critical role for graduate students during their research and studies.
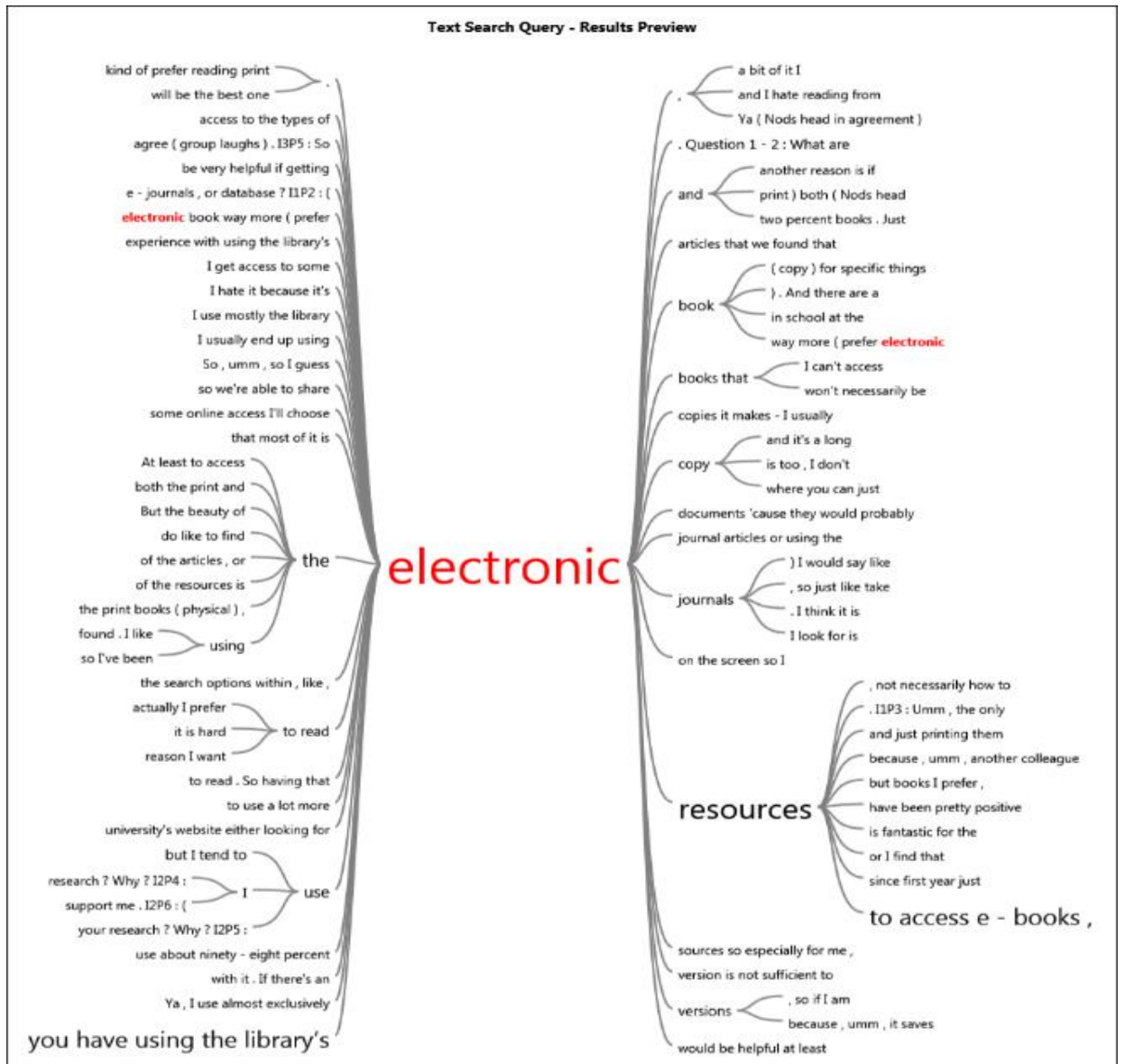
Figure 5. Word tree of the word "electronic".

Using word frequency queries to list the most frequently occurring words or concepts in the data sources can help researchers identify possible themes and identify the most frequently used words in transcribed documents (NVivo, 2018b). Morrison used NVivo's frequency query for doctoral research and explained "a word frequency query was processed in NVivo on all responses to investigate if this analysis supported the content analysis" (2018, p. 149). According to the NVivo software, "display words"

depicted a word cloud for word frequency (Figure 6) for all focus group transcription documents. This feature chose 1,000 of the most frequent words used in the focus group sources. To avoid the appearance of pronouns such as "that," "this," and "one," the system requires a minimun length for most used terms of five letters. NVivo can exclude some important words that have the same length. So, the most frequent terms within the qualitative data set were "library," "think," "questions," "Google Scholar," "resources," and "electronic." This word frequency indicated common themes and appeared the top of the word frequencies from the transcription documents. Combinations of words/phrases, such as 'Googles Scholar' and 'electronic resources'. These top word frequencies may indicate factors that identify graduate students' information seeking preferences. Morrison also used word frequency query to create a word cloud for college learner motivations, suggesting that "word cloud[s], common themes from the manual coding also float to the top of the word frequencies in wanted degree, job, and work" (2018, p. 139).

Figure 6. Word frequency query of word cloud.

<div align="center">**Information Seeking Preferences**</div>

According to the focus group questions in section one, there were four themes with respect to the results for graduate students' opinions for reading preference: visiting the library to use the library's resources, visiting the library's web page, using Google Scholar, and using non-library gateways.

Preferred Method for Accessing Resources

A "Matrix coding" query with NVivo was run to obtain the preferred method of accessing resources results. Generating a node matrix with rows required three preferences because the second level of the nodes as preferred format, preferred electronic, and preferred print. The generating node matrix with columns was the first question in the first level of node. Table 25 offers the reasons for preferred methods, related trends, and the percentages of the preferred methods. Electronic resources had a preference rating of 70.59%.

Table 25

Results for Preferred Method for Accessing Resources

Preferred format	Reason	Trend	Percentage
Electronic	Positive for using electronic materials: − Reference easily − Move quicker along − Multiple-access allowance Negative for using print materials: − Too heavy to carry	Used electronic materials for searching; when article found, save it as computer file	70.59
Both formats	Positive for using print materials: − Help direct quotes − Comfortable read on paper	Used electronic materials for searching; when article found, print it out	17.64

| Print | Negative for using electronic materials
− Sensitivity issues, eye tired,
− Fonts too small,
− System problems | Used electronic materials for searching; when article found, print it out | 11.76 |

To establish the results illustrated in Table 26, NVivo transferred characters to numeric numbers that were established by the transcription documents for preferred method. These results showed that most participants preferred electronic resources. When transcribing the students' opinions in the original transcriptions, there were some issues regarding the preference for accessing resources. With respect to preferring both formats, one participant noted a preference for print sources but a tendency to use electronic resources, while another participant estimated that 98% of the sources she used were electronic, and the other 2% were print books. In contrast, one of the participants who preferred print stated that looking at a computer screen for an extended period of time exhausted her eyes and made it difficult to read. To resolve this issue, she would start her research online, print the articles she wanted to read, and then highlight information she deemed important. The other student who preferred print was sensitive to light; therefore, she also opted to print electronic resources. The Node Matrix results showed that 70.6% of focus group participants preferred to use electronic resources: 17% of the participants used both formats, and a small number of the participants preferred using print, though they still used online resources for the topic searching.

Table 26

Preferred Method Node Matrix

Format	Preferred method	Percentage
Preferred both formats	3	17.6
Preferred electronic	12	70.6
Preferred print	2	11.8
Total	17	

Physically Visiting the Library

The second question put forward to the focus group sought to develop an understanding of the advantages and disadvantages of having the students, particularly graduate students, physically visit the library to use the library's resources. There were sub-nodes for those who visited the library and those who did not. The NVivo node matrix illustrated that many of the participants were willing to visit the library to use the library's physical resources when they had issues using virtual resources (Table 27). Some of the participants who visited the library did so because they did not know how to virtually deal with problems they faced when using the library's resources. Others visited the library to take advantage of in-person information services, such as reference and bibliographic services. Participants reported having positive experiences with these services, which encouraged them to visit the library. "Come to the library physically" was mentioned 19 times.

Table 27

Participants Who Physically Visit or Do Not Visit the Library

Physically visiting library	No. of times mentioned
Come to the library	19
Don't come to the library	15

The NVivo node matrix indicated the reasons the participants were not willing to visit the library to use the library's resources. A number of students noted that they simply did not know much about the library's services. The majority of students who partook in the focus groups did not know about library-held orientations or instructional sessions at all or mentioned issues relating to accessibility for the aforementioned resources (Table 28). They also indicated they did not attend the library held sessions, and they assumed they would get results by themselves. This issue indicates that library orientations and instruction sessions need to be implemented in a better way to attract more graduate students' attention as the purpose of a library orientation or instruction session is to teach students the basic knowledge about the library and its services.

Table 28

Reasons for Physically Visiting the Library

Physically visiting the library	Reasons
Come	Positive:
	− Got more services (reference query, got more related information)
	− See what else is around in the library
	Negative:
	− Couldn't access the materials from home
	− The materials are not online
	− For group meeting
Do not come	Positive:
	− Scientific journals access is stable
	− Access the library's collection through their own office
	Negative:
	− Lack of information about the library
	− Bibliographic information complicated
	− Used alumnus access through other universities
	− Fix the problems by themselves
	− Distance (downtown campus…)

Accessing the Library Resources through the Library Website

This question asked the participants about their opinions on the library's

integrative system (Primo) and its functionality in order to determine how the website

could properly meet their expectations. The NVivo node matrix (Table 29) illustrates the

advantages and disadvantages of the library's website as suggested by the participants.

For example, one participant noted that when she could not find a specific article in the

library's website, she would simply give up her search or use a less relevant resource.

This participant did not ask for any assistance and did not utilize the InterLibrary Loan

services provided by the library.

Table 29

Reasons for Accessing the Library's Website

Accessing the library resources through the library website	Reasons
Advantages	– One Stop Search quickly look up – Good "Cited by" feature – Intuitive layout of the website – Can access more than Google Scholar – Easy to access the library website off-campus – Access another search engine through the webpage
Disadvantages	– Bookmark did not work (search again, search results disappeared) – Webpage needs to figure out every time – Layout issues (screen size, many things in one place, timeout) – Database formatted differently – Hard to save the research results – No update information – The search results are not as relevant as Google Scholar – No access for some of database (e.g., Factiva)

Impacts of Google Scholar or Non-library Gateways

Google Scholar and non-library gateways have proven to be popular tools among

students who are seeking academic journals, books, conference papers, theses, and

dissertations. Students like using Google Scholar as the search engine has helpful features,

such as "cited by," "related articles," "cite," and "save," which make it even more

popular. Zientek, Werner, Campuzano, and Nimon (2018) studied the use of Google

Scholar for research and observe that Google Scholar "can help identify the collection of

publications for a particular research topic" (p. 41). Moreover, they note that "for each

article, a 'Cited by' link is provided" and that "clicking on that link takes the reader to an article's 'cited by' list", thereby allowing researchers "to identify more articles on a given topic by reviewing citations of these articles" (p. 41). Thus, the third part of the focus group posed a question that asked for participants' opinions about how Google Scholar and non-library gateways impact their research.

The participants had varying answers, so there were two groups of nodes created for the two pieces of content outlined. A majority of participants were familiar with Google Scholar; however, only one participant referenced another non-library gateway: ResearchGate. Therefore, the study lacked sufficient data on non-library gateways to develop any conclusions as it is unclear if participants are aware of other non-library gateways besides Google Scholar. The NVivo matrix node (Table 30) illustrates the advantages and disadvantages that the participants associated with Google Scholar, for which participants viewed an equal number of pros and cons.

Table 30

Reason for Using Google Scholar or Non-Library Gateways

Google Scholar or non-library gateways	Reasons
Google Scholar	Advantages: – Use it for beginning of searching, end up going to Primo to get the article, as secondary sources if not available in the library – Cannot find in Primo, but can find in Google Scholar – Brought up earlier with Google Scholar – The interface of Google Scholar looks clean – Effective Google Scholar features: Image search, cite, wide variety results, related articles Disadvantages: – Unlabeled for scholarly sources – Overwhelmed for the search results

|	
	– Many extra things, lot of irrelevant materials
	– Not use it for meta-analysis
	– No full text access
ResearchGate	– Directly to use it and look up the authors
	– Author put up their own work
	– Can request a copy from the author by email

Overview of Results for Information Seeking Preferences

The study also investigated graduate students' opinions about information-seeking preference. This relates to the preferred format of materials, reasons for physically visiting the library, accessing the library webpage, and the impact of Google Scholar has on graduate student research. The answer for using Google Scholar was the highest number compared with the library website and other search engines, which means Google Scholar and other non-library resources deeply impacted the participants' studies. Most participants stated their research is conducted first on Google Scholar, and then they turn to the library's website, Google Scholar is positively impacting their studies.

In addition, the answer for "physically visiting the library to use the resources" was the second highest number, which means that more participants come to the library than participants who "don't come to the library." However, the most common reasons for visiting the library were activities other than "use the resources." As shown in Figure 7, there was a trend toward seeking information via electronic tools. Since electronic resources now play a significant role in academic libraries, students visit the library to not only look for materials but also to ask for reference assistance, attend a class or group meeting, or use the onsite facilities.

It is important for students to be able to access the academic library's electronic collections and resources with ease. One way to ensure accessibility of electronic

resources for library users is to maintain a library website that has a friendly interface. Furthermore, the library website as an interface bridges the library's electronic resources with the library's users. Therefore, the website's implementation directly impacts the usage of electronic resources. The feedback for the website from the participants, however, was more negative than positive. Criticism included inconsistent database formats, electronic resource packages updated without any information, and website layout issues. Consequently, participants often used Google Scholar for their research as they found it easier to use and navigate. Facing this issue, in 2017, the library's discovery layer (Primo) was updated with a "cite by" function. The library website is making progress to be more like Google Scholar.
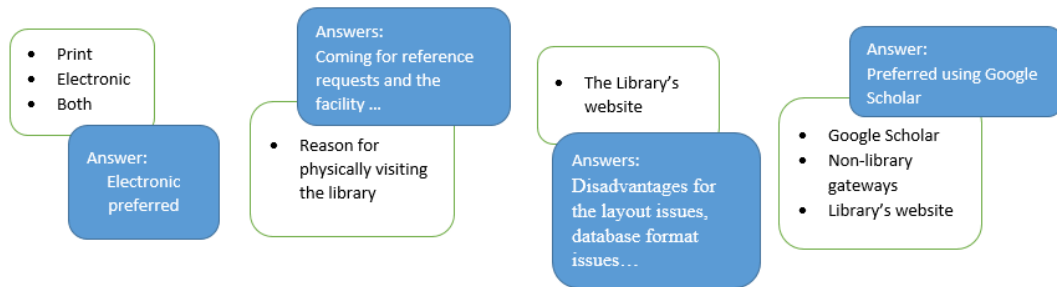
Figure 7. Information-seeking preference.

Knowledge of the Library's Electronic Resource

There were three questions in the focus group guide section two, which sought to establish an in-depth understanding of graduate students' opinions regarding their experiences using electronic resources from the library's collections, how to rectify issues they encounter when doing research, and the difference between Google Scholar and Primo.

Experiences Using the Library's Electronic Resources

Through group purchasing, the consortia Ontario Council of University Libraries (OCUL) and Canadian Research Knowledge Network (CRKN) purchased electronic resources that "comprise over 95% of what [they] spend [their] acquisitions dollars on year over year" (Calarco, 2017, p. 4). Although group purchasing has saved the library a large amount of money, this purchasing method has had negative effects for library users due to high numbers of resource management issues. Some of these issues include corrupted links, system errors, and remotely using the library collection issues. As a result, for students must have exceptional computer skills to navigate these errors and successfully conduct research. The NVivo node matrix indicated that the results were varied (Table 31). The participants' comments regarding their experiences when using the library's electronic resources described a difficult situation.

A majority of the students participating in the focus groups mentioned that they had their own habits for accessing resources with corrupted links. These alternative methods included using their alumni access from their undergraduate university, using a friend's access information, or giving up and finding another article or resource. However, some students stated that they found using Primo to be a positive experience as the electronic resources could be easily accessed and the library staff were incredibly helpful. Although the focus groups highlighted both positive and negative experiences of using the library ILS, the majority of participants found the software to be problem-ridden and inaccessible. As illustrated in the node matrix result, the participants identified 16 disadvantages and only 12 advantages with regard to accessing the library resources through the library web page. Thus, it was clear that this phenomenon warrants close

consideration from academic libraries and information literacy librarians so as to improve

the library's website and its training guide.

Table 31

The Experience of Using the Library's Electronic Resources

Experience using the library's electronic resources	Reasons
Electronic journals	Positive: − Easy to find the articles − Most of journals are online − Can download all of the articles Negative: − Holdings had gaps − Too many results without relevance
Electronic books	Positive: − It is pretty helpful, save students' money − Like to use course textbooks online − Easy to search for a word or sentences Negative: − Cannot download whole book
Database	Positive: − Been kind of useful Negative: − Confused by social work databases, not comfortable relying One-Stop-Search
Electronic resources as whole	Negative: − Struggle with online resources − The link was there, but the full text was not available − Broken links − Requested to pay for the electronic resources − Not available − Doesn't have a print function

Rectifying the Problems

When library users such as the participants encounter problems accessing electronic resources, the library provides a troubleshooting system called ELECPROD, which is designed to fix accessibility issues in order to help users to get the electronic resources they need for their research. This is standard practice to help users for accessing academic library electronic resources. However, the results from this focus group did not support the library's efficient services for the library's users (Table 32). The NVivo node matrix illustrated that 15 participants stated that they had never used this service, one student did not respond, and only one participant confirmed having used the service, and the latter participant had only used the service on one occasion. Based on these comments, most of the participants did not know the troubleshooting system existed when they encountered problems. Consequently, they either asked for help from another university, or gave up on using the materials.

Table 32

Results for Using the Troubleshooting System

Rectify the problems	Reason
Never used	– Never knew about the troubleshooting system
	– No difficulties for searching
	– Never used the troubleshooting system
	– Didn't realize the troubleshooting system existed
	– Never heard of the troubleshooting system
Used	– Used once, quite helpful

Understanding Google Scholar and Primo

Many studies mentioned that students use Google Scholar for their academic research, such as Aslst (2010) and Zientek et al. (2018). However, academic libraries make significant efforts to manage commercial Integrated Library Systems (ILS). The University of Windsor's Leddy Library adapted Alma (the name of the ILS) and Primo, which is the discovery layer for Alma that was developed five years ago. Alma and Primo, along with the library's subscription collections, provide services for the library's users. Furthermore, some of the electronic collections' purchasing prices are dependent on usage. For example, for Scholar Partial collection, items with higher usage will have a lower cost for purchasing. For these reasons, the library and librarians encourage library users to use their collections as much as possible. However, Google Scholar is a freely accessible Web search engine that is open to the public and has easily navigable search features. Thus, it attracts many students who are conducting research. By exploring troubleshooting issues, this question sought to develop an understanding of students' perspectives with respect to using Google Scholar and Primo. The NVivo node matrix illustrates that students were eager to discuss these questions and offered many perspectives.

Table 33

Results between Google Scholar and Primo

Understanding the results between Google Scholar and Primo	Reason
Google Scholar	Positive: − Fewer clicks − Better access to electronic books − Provides types of citation about the articles − It is available to everyone − Google just gives whatever with all the key words − Clearly for the format of the materials (journal, book, etc.), give exact word, related, and a broader scope. − Gives like seven or eight pages Negative: − Sometime cannot access to the full text − Cannot access directly − Database isn't available − Too many irrelevant results − Cannot download the journals and books (copyright knowledge issues) − It is not more scholar website
Primo	Positive: − Easy to find the full articles − Subscription materials − It is more focused on the area of category − It can download the journals and books Negative: − More clicks − Less subscriptions journals − Access to other university's database through Google Scholar, not using Primo − Just been using Google Scholar, don't know about Primo − Primo only recognize two of the authors (cataloguing rule issues for AACR2) − Access issues with databases − One-Stop-Search, copy and paste the entire think in there, it won't find article, it just is worse − One-Stop-Search result is very limited

Overview of Results of Knowledge of the Library's Electronic Resource

The study investigated graduate students' knowledge of the library's electronic collection. It involved experience with electronic resources, awareness of the library's troubleshooting system, and understanding results from Google Scholar and Primo. The study found that Google Scholar was used slightly less often than Primo. However, the participants preferred to use Google Scholar for their first search. If the articles that students were looking for were not available on Google Scholar, they then used the library's electronic resources. Thus, the participants in the focus groups identified Google Scholar as the optimal search engine for conducting research and used it in conjunction with the library's electronic resources to obtain the best research results. Participants stated that they used Google Scholar to find the necessary articles then switched to Primo to gain access to the documents, making the resources interdependent. However, 94% of students within the focus groups never used the library's troubleshooting system to rectify the problems encountered when accessing electronic resources. When the students had problems accessing the online resources, they did one of three things: (a) used another university's electronic resources, (b) gave up on the article or book, or (c) solved the problems by themselves.

Furthermore, most of the student participants did not know that Primo has a one-stop-search function; it can be searched as journal article title and it also covers resources from institutional repositories, such as Open Access at the university. Yet no participants mentioned this feature during the focus groups. With respect to Google Scholar, participants complained that some of the full texts could not be accessed or downloaded, and they found too many irrelevant results. The participants did express knowledge about

the library's collection in their research field, yet they did not seem to know how to use Google Scholar materials properly and effectively.

The ACRL's (2015b) information literacy *Framework* requires that graduate students should understand the resources available within the library's collections that are related to their field of study, yet many participants still preferred to use Google Scholar as a primary searching tool. This is problematic as most students did not understand the results of their Google Scholar searches. As a result, they often ended up using less relevant items in their assignments. Due to subscriptions as well as the platform changes, the participants experienced some of the different issues when accessing full text, particularly Primo's search function, which requires more clicks in order to get the article or book. In such instances, the results were limited. This problem processing, seen in Figure 8, illustrates the factors students consider when deciding which search engine, electronic resources, and library's services to use.

Preferred to use Google Scholar and non-library gateways → Never used the library's troubleshooting system → Lack of the knowledge for FAHSS electronic resources → Give up and changed the search model
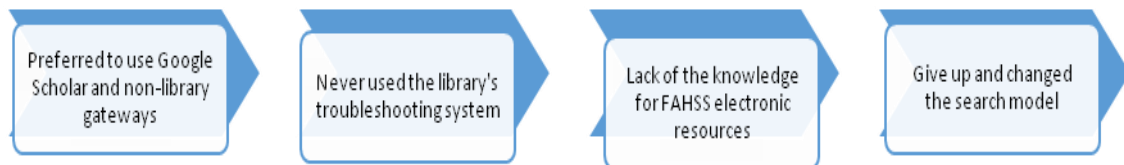
Figure 8. Problem processing pathway.

Summary of Focus Group Findings

Information seeking preference and knowledge of the library's electronic resources were two topics that were discussed in the focus groups. The results identified five common phenomena: (1) most of the participants preferred to use electronic resources, (2) most participants visited the library to ask reference questions and other activities, (3) during the research process, Google Scholar is often the first resource they solicit, (4) Primo's was challenging for some participants, and (5) most of the participants

never used the library's troubleshooting system to rectify the problems encountered when accessing electronic resources.

Correlation of Online Survey and Focus Group Results

According to Creswell and Plano Clark (2011), the fourth step of the convergent parallel mixed method design procedures involves two process. The first is summarizing and interpreting the quantitative and qualitative results; the second is discussing whether and how the qualitative results explain the quantitative findings. In order to correlate the data from the online survey and focus group, the results of the five categories and two sessions from the focus group have been summarized here.

Summary of Quantitative and Qualitative Data

Demographic information was imbedded into quantitative data. The results showed that the "language spoken at home" is correlated with participants' information literacy skills. The scores for correct answers for the category of knowledge of electronic resources were the highest at 81.3%, and the correct answers score for information literacy assessment was the lowest as 45.9%. Four categories were significantly correlated to each other; however, they were not correlated to the "information literacy assessment" category. Based on qualitative data results from the focus groups, participants preferred to use electronic resources when conducting academic searches, which was related to the online survey questions in the category as "knowledge of electronic resources". However, Google Scholar and the library's subscription materials were their major research sources. Many of the participants used Google Scholar as the first source when they begin their research. In addition, most of the participants did not know that some of their research materials might exist in the library's collection, nor did

most of them know how to request the library's services to rectify problems they encountered.

Understanding of the library website: Primo. The participants did not know about Primo and Alma's practical features and the potential benefits for their research. The focus group results showed some of the participants' qualitative statements contradicted the results of the quantitative online survey. Over 50% of the participants, for example, rated themselves as "above average" in ability to search library databases and the Internet in the online survey; however, in the focus groups portion of the study, most of the participants preferred using non-library gateways for their research, though they have no training in the one-stop search feature within the library's catalogue. Furthermore, most of the participants did not know about the library's assistive services, such as the library's instruction sessions and the electronic resources troubleshooting system. There was a strong correlation between the participants' information literacy skill levels and their use of Google Scholar and Primo. From the online survey and focus groups data, some of the participants who did not have proper information literacy training tended to use Google Scholar as a primary search engine for academic research. Primo, the Library's main search engine, was utilized less often. This may be due to the nature of this ILS as the system is still under development. Therefore, using Primo to locate the electronic resources, may require more knowledge about searching for electronic resources. The participants also noted Google Scholar's searching method is more efficient and has a spell-check feature. This proved more advantageous than the library's electronic resources searching methods, which participants reported were less flexible and required more sophisticated knowledge about library search engines rather

than simply web search engines. Google Scholar's "cited by" feature also highlighted related articles and some of the available full text for helping the participants' research. At the time of the survey and focus group, Primo did not have these features, which the participants found useful. According to this research result, the library needs to consider updating Primo's features in order to assist graduate students' research.

Understanding the library's electronic collection. The databases and some of the platforms, such as the electronic collection the library has a subscription to, require users to adopt different searching strategies. The participants who lacked knowledge of the electronic resources collection and information literacy skills could not navigate this information for their research. Therefore, when they used the library's electronic resources and encountered problems when locating books or journal articles, they gave up the searching, solved the problems by using their own method, or assumed the search results were the best they could obtain. This phenomenon can be easily resolved for students by visiting their university library and asking for assistance or by taking advantage of the electronic troubleshooting system. Academic libraries have strong teams in place that promote information literacy skills training and information services (Kolsted, 2015). However, the students need to be aware of the services and consider them as essential for successful research.

Citation and ethical considerations & copyright scores. The scores for citation and copyright and ethical considerations were not satisfactory in the focus groups. A number of the participants thought Google Scholar was open to the public and that it allowed people to download entire books and full text articles. Many of them also complained about full-text downloading issues. They were not aware, however, that any

full-text material they can access through Google Scholar is either in the public domain or provided to them through the library's subscriptions. Also, the Copyright Act of Canada, Fair Dealing Policy, which it is linked in the library website, mandates that user can copy "(a) up to 10% of a copyright-protected work (including a literary work, musical score, sound recording, and an audiovisual work), (b) one chapter from a book, (c) a single article from a periodical" (Leddy Library, 2013, p. 1). Therefore, downloading an entire book is illegal.

According to the ACRL's *Framework* (2015b), librarians' information literacy training guide should covered these frames, including the concept that "information has value", so as to encourage student to consider the importance of citation and the ethics of using copyrighted material. For example, in practice, the librarian includes the copyright content in their information literacy training session, as well as in the information literacy training guide. The librarian explains that photocopying, scanning and copying of any kind from copyrighted works must be limited to what is allowed under the Copyright Act of Canada. Yet, most participants did not obtain this knowledge of copyright from the librarian instruction because, even if they were aware of the training, they did not attend it. In this study, approximately 54% of the participants did not attend a library orientation, 9% of participants were not aware of the library orientation held in the library. Therefore, it would be useful to reflect on why there are differences between the graduate students' self-evaluation of their information literacy skills and their actual information literacy scores. For example, students evaluated themselves positively for searching the internet for information, giving themselves the ability for searching library database and Internet on average 78.7%. However, out of the other categories in the

online survey questionnaire, such as the four questions surrounding "ethical considerations & copyright," only 15 participants (15.6%) gave correct answers of all four questions. This phenomenon needs further investigation to determine the reasons why students' self-perception was higher than the actual scores as it may benefit librarians when they design graduate students' information literacy training.

Knowledge of electronic resources. The survey score for this category was 81.3%, and it was much higher than the category of "information literacy assessment"; however, the focus group answers indicated that participants preferred to use Google Scholar and some of the non-library gateways. These results indicated that the participants were confused about the databases and electronic resources platform formats, that they lacked skills for database and electronic resources searching methods for their disciplines, and that they did not know the library offered such services for using the library's collection. Therefore, some of the participants either refused or ignored assistance options for electronic resource searches and turned to Google Scholar or non-library gateways. These phenomena and attitudes impacted the graduate students' information literacy skills outlined by the ACRL's *Framework* (2015b), which values searching as strategic exploration, research as inquiry, information having value, and information creation as a process. To remedy this situation, the library and the librarians should do more to advertise the orientations and get into classrooms to introduce the library's databases and electronic collection training.

Graduate students' information literacy status and challenges. The participants' correct answer score crossed the cut-off scores; only the category of information literacy assessment's correct answer score was lower than 50%. However,

within the focus group discussion, there were issues with respect to using the library's electronic resources and the library's service system. Since most participants were either not aware of or ignored the library's electronic resources service and instruction, they relied on their own understanding of databases and electronic resources usage and often struggled when using the library's electronic resources. When they encountered problems, they chose to give up, use other universities' collections, or get angry about issues such as the payment alerts. The participants faced many challenges. For example, not all of them got the appropriate information literacy skills training, such as the library's orientation or instruction session or one-on-one intensive instruction. It is surmised that the absence of instruction and training explains their lack of knowledge when using the library's electronic resources and obtaining the library's services. Most of the challenges the participants mentioned during the focus groups were not serious problems or questions, such as databases' features, payment requests, and journals' holdings issues.

When considering such challenges, the library needs to consider establishing and developing more effective training methods to improve graduate students' information literacy skills. The current practice for information literacy training relies on several orientations at the beginning of the semester, library instruction sessions during the semester, and one-on-one instruction as requested by students, but these collective efforts are not enough to facilitate and develop graduate students' information literacy skills. However, in reality, librarians often have trouble getting into classrooms as faculty have little time in class to teach disciplinary concepts, and certain departments do not see this as a priority. However, given that the current study's results indicate that graduate

students' information literacy is not satisfactory, such efforts need to be made. This is especially in the fast-paced environment of academia; thus, universities must focus on students' needs for information literacy skills. Despite the fact that students are paying thousands of dollars to do research with experts in their fields in academic institutions, results from online survey question 28 suggest that 17.9% participants do not understand the difference between the citation for an article and a book chapter. This is not acceptable and should cause librarians and faculties to think deeply about students' inability to conduct effective research. Table 34 presents some graduate students' thoughts about their information literacy status and corresponding challenges for focus groups. The results of the research questions from the online survey and the focus groups provide a number of insights.

Table 34

Information Literacy Status and Challenges

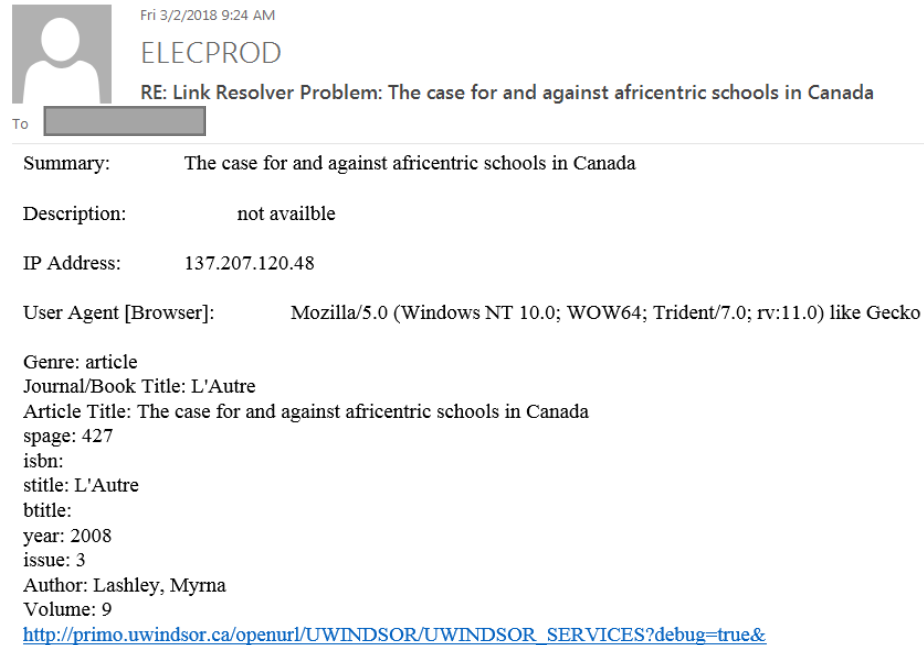| Category	Status	Challenges	Correct answers	Support needed
Search strategy	Preferred using electronic resources; less than half of them understood the terminology for their disciplines; half of them knew how to use searching strategies	Need to understand disciplinary databases and their searching features	54.7%	Database training for searching method
Knowledge of electronic resources	Had a fair understanding of how to locate electronic database; lacked knowledge about the library's collection; not aware of the library service for electronic collection	Need to understand the library's electronic collection for their disciplines; need to know how to use the Integrated Library System-Primo	81.3%	Introduction for the library's collections; database usages; enhance public awareness for the library instruction
Information literacy assessment	Lacked knowledge about references; most students did not know how to determine the information values	A lot of irrelevant materials; searching strategic exploration issues	45.9%	Need more reference help; more information literacy skills with regard to

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				information creation and research inquiry
Citation	Had a fair understanding of the knowledge of citation	Need to understand the primary literature type	73.4%	Need more training for APA, MLA, and other kind of citations
Ethical considerations & copyright	Lacked knowledge about using government documents; most students didn't know about fair dealing	Need to know about fair dealing policy; need to learn using government document correctly	61.8%	Need more training for fair dealing

ELECPROD Report Data Analysis

ELECPROD is designed as an email service that the library's users can use to report problems using the library's collection. A team of library staff monitors the ELECPROD email box on a moment-by-moment basis. When a report has been received, the problems are either addressed or referred to Interlibrary Loan services so that the materials can be ordered for the requester. Within two hours, a response email is sent to the user to confirm receipt of the email and the actions that will be taken to resolve the issue. There are four potential types of issues with respect to the content of the ELECPROD reports: accessing the electronic resources off campus, incorrect link, journal title identification, and understanding the collection's holdings (see Figure 9). However, from May 1 to July 4, 2017, ELECPROD only received 16 reports.
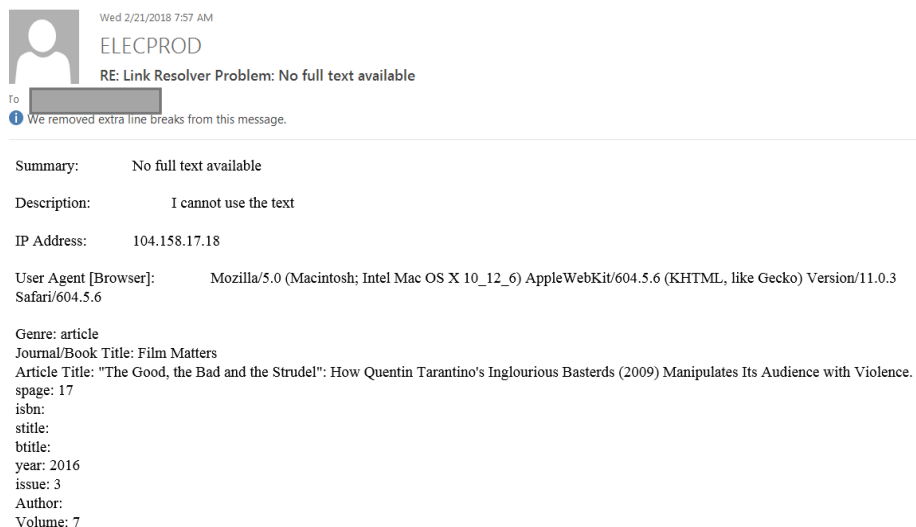
Figure 9 illustrates a group of emails received at ELECPROD and the correspondences between the library's staff and ELECPROD users. The first figure indicates that the ELECPROD user did not read the information carefully in the search result. The second and third figures indicate that the ELEPROD user did not know how to

read the holdings for the journal. The last figure shows the location for the ELEPROD

report at the bottom.

Fri 3/2/2018 9:24 AM

ELECPROD

RE: Link Resolver Problem: The case for and against africentric schools in Canada

To

| Summary: | The case for and against africentric schools in Canada |

| Description: | not availble |

| IP Address: | 137.207.120.48 |

| User Agent [Browser]: | Mozilla/5.0 (Windows NT 10.0; WOW64; Trident/7.0; rv:11.0) like Gecko |

Genre: article
Journal/Book Title: L'Autre
Article Title: The case for and against africentric schools in Canada
spage: 427
isbn:
stitle: L'Autre
btitle:
year: 2008
issue: 3
Author: Lashley, Myrna
Volume: 9
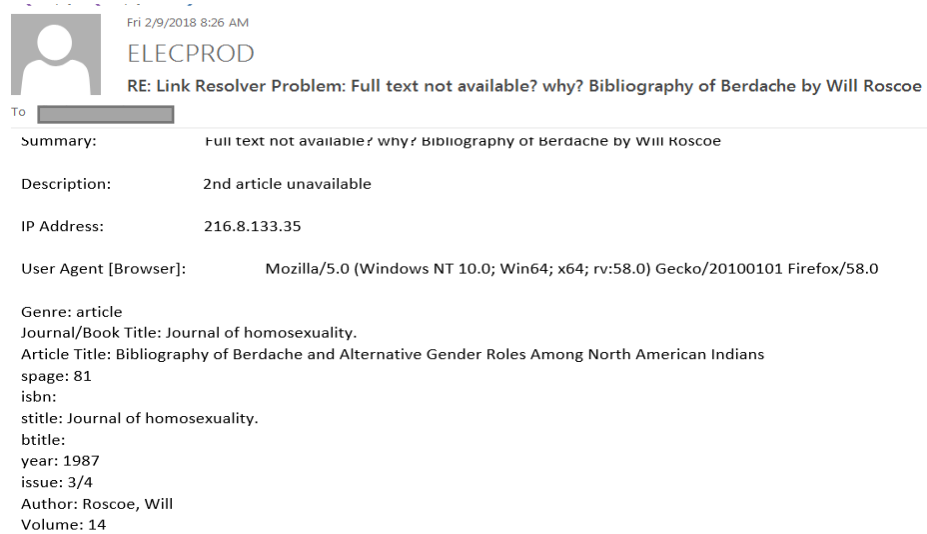http://primo.uwindsor.ca/openurl/UWINDSOR/UWINDSOR_SERVICES?debug=true&

Note: the response email to the user: the library does have the article available for download both on and off campus. However both the journal L'Autre and the article is in French. If you use Google Chrome it has a translate feature that will enable you to read the article in English. There is an icon in the upper right hand corner of the address bar that changes the language to English. Please note that you have to use the html version to read the article in English, if you download the pdf version the article remains in French.

Figure 9. Emails received from ELECPROD.

Wed 2/21/2018 7:57 AM

ELECPROD

RE: Link Resolver Problem: No full text available

To

ⓘ We removed extra line breaks from this message.

| Summary: | No full text available |

| Description: | I cannot use the text |

| IP Address: | 104.158.17.18 |

| User Agent [Browser]: | Mozilla/5.0 (Macintosh; Intel Mac OS X 10_12_6) AppleWebKit/604.5.6 (KHTML, like Gecko) Version/11.0.3 Safari/604.5.6 |

Genre: article
Journal/Book Title: Film Matters
Article Title: "The Good, the Bad and the Strudel": How Quentin Tarantino's Inglourious Basterds (2009) Manipulates Its Audience with Violence.
spage: 17
isbn:
stitle:
btitle:
year: 2016
issue: 3
Author:
Volume: 7

Note: this article is not available in the library as we do not have the journal. You can submit a request through RACER for any article(s) not available in the library. It will not cost you anything. You can do this by going to the library Home Page: http://leddy.uwindsor.ca Click on "Order from Other Libraries."

Figure 9. Emails received from ELECPROD.

Fri 2/9/2018 8:26 AM

ELECPROD

RE: Link Resolver Problem: Full text not available? why? Bibliography of Berdache by Will Roscoe

To

Summary:	Full text not available? why? Bibliography of Berdache by Will Roscoe
Description:	2nd article unavailable
IP Address:	216.8.133.35
User Agent [Browser]:	Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:58.0) Gecko/20100101 Firefox/58.0

Genre: article
Journal/Book Title: Journal of homosexuality.
Article Title: Bibliography of Berdache and Alternative Gender Roles Among North American Indians
spage: 81
isbn:
stitle: Journal of homosexuality.
btitle:
year: 1987
issue: 3/4
Author: Roscoe, Will
Volume: 14

Note: The library does not have the year of coverage that you require, out of the three electronic links the earliest start year is 1996. The library has the print format of this journal, with the year you require. You need to go to the shelf to retrieve it, and you cannot request print that the library has through the Inter-Library Loans Office. This is the location and call number: Basement of the West Building, 2nd floor HQ75 .J678 v.214 1987

Figure 9. Emails received from ELECPROD.
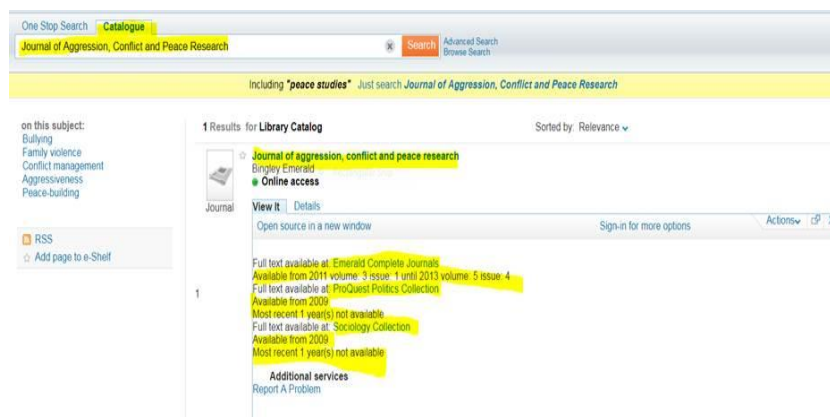
Note: The reason as to why the Dr. is having difficulty accessing the article is we don't have the year available for the journal, as you can see in the screen shot from Primo. Two of the collections have a 1 year embargo and Emerald ends with 2013. The Dr. can order the article through Interlibrary Loans.

Figure 9. Emails received from ELECPROD.

Table 35 offers a summary of ELECPROD reports and solutions from the library staff. These questions demonstrate some of information literacy skill issues, which include failing to understand journal holding information, the library's electronic resources, bibliographic knowledge, and citation issues. Furthermore, some of the problems are related to information literacy skills, such as searching in Primo and Google Scholar. Some of the questions highlight the issues related to electronic resources access, such as broken links. An overview of the ELECPROD reports indicate multiple challenges regarding students' information literacy skills. The problems seen in ELECPROD reflect many of the concepts that are taught in information literacy training that students can benefit from.

Table 35

ELECPROD Questions and Solutions

Questions from users	Solutions from staff	Problem
The article is not available	Sent to ILL as we do not have the year requited	Holdings issues
Available from the year of 2000 to current but it is not there	Two of the collections have a 1 year embargo and Emerald ends with 2013	Holdings issues
Article seems inaccessible without a fee	Years of coverage incorrect, made correction in Alma	Understanding subscription issues
I cannot download the full article the website says: access denied	There are multiple links for this journal, may not have used the correct link	Holding and other issues
The link does not lead to anywhere. I cannot find the page	It was a chapter in the book. Sent instructions on how to find /download	Citation and bibliographic issues
I would like to access this article, but it is not showing up as available through the library website	Found the article for free on internet	Did not know about the library's collection, searching skills issue
Please help me to get the paper	May have used one stop search article has no full text in one stop search	Don't understand the library' website
Has the old website address changed to this new portal?	Link not working both on and off campus. The subscription changed, OCUL provided a correct link	Electronic resources management issues
Neither of the links to this article will open	This could have been a problem with our server	System issue
Unable to access journal article from the ACS	Message subscription expired in the morning; the access could be gained by the afternoon	System problem: The server was temporarily down
The page has not been configured for access	Link does not work; host name authorized EZproxy enabled, do not require EZproxy for free e-journals	Electronic resources management and system issues
This was part of Springer package, but is not anymore	No longer has current access; the record needs to be corrected	Electronic resources management issues
Link in record leads to an incorrect title	The link goes to the publication's search site with a drop-down button.	Electronic resources management issues

CHAPTER 7

DISCUSSION, CONCLUSION, AND IMPLICATIONS

This study was designed to investigate graduate students' information literacy status and the challenges graduate students encounter when searching for appropriate electronic collections. Convergent parallel mixed methods were utilized, and data were collected through an online survey and focus groups. In addition, the troubleshooting report data were collected to help explain the data from the online survey and focus groups. This chapter discusses the key findings of the study and provides implications and recommendations for future practice and research.

Information Literacy Status of Graduate Students

There are four considerations regarding the status of graduate students' information literacy, including failure to attend information literacy training, participants' limited knowledge of using electronic resources, participants' status of information literacy, and participants 'information seeking' preferences.

Lack of Attendance for Information Literacy Training

There were three types of sessions for participants: library orientation, library instruction, and one-on-one instruction. Library orientation meant that students received a library tour with basic knowledge around the services of the library. Library instruction meant that student would get subject specific information literacy training. One-on-one meant that students would get specific information literacy training directly tied to their assignment. The number of participants who received any type of such instruction was extremely low: only 58.5% of the participants attended a library instruction session held in the class; only 35.3% of the participants, attended an orientation in the library; and

only 19.5% participants had attended one-on-one intensive organized instruction with the librarians. With regard to electronic resources services offered to library users, such as ELECPROD email services communication, only 5.9% of participants used the library's troubleshooting service.

To address low attendance levels, the library should implement campaigns that highlight the importance of information literacy training. Concurrently, when librarians design an information literacy program, they need to address the issue for students' indifference of information literacy programs. Rioux addresses students' reluctance to utilize library services, and as an instructor in the Resources for Development Professionals program at St. John's University, he designed a course that teaches graduate students about information and research skills, including learning about using, creating, and sharing authoritative information resources (Rioux, 2014). One of Rioux's students provided a response to information literacy training: "I had no idea all of these [resources] existed and were available" (in Rioux, 2014, p. 28). The current study provides a similar picture at the University of Windsor. This suggests that librarians and faculty members need to increase their efforts and work closely together to ensure graduate students attend libraries' information literacy training and information services so as to enhance students' research skills and improve their academic output and performance.

Participants' Knowledge of Using Electronic Resources

Without information literacy training, particularly database and electronic resources platform instruction, graduate students will have difficulty effectively and efficiently navigating and utilizing various electronic resources. JSTOR, for example, is a

commonly used electronic resources platform by the FAHSS students, and the research results suggest that 77.9% of the participants understood that JSTOR is the most appropriate database for their research; however, the remaining participants either skipped the question or chose the wrong answer. These participants need more knowledge regarding the electronic resources. Head and Eisenberg (2011) found that a limited number of students at the University of Washington utilized electronic resources through the library: only 11% used a scholarly database, and between 33-37% used JSTOR, Academic Search Premier, or both (p. 16). The lower usage for library electronic resources reflects the students' reading tendencies and their knowledge of electronic resources.

Participants' Status of Information Literacy

The results underscore that though participants had some understanding of information literacy, they lacked a comprehensive understanding and had deficiencies with regard to some critical concepts. For example, the results of question 14 suggest that 81.8% of participants knew that "professional conference and journal articles" could be used as a primary source when conducting research. Though this would be a relatively high number in the general population, for graduate students, this number should be close to 100%. The questions 17 and 36 tested participants' understanding about the terminology regarding Canadian term versus American term. The results from there questions were low. Thus, these results suggest that students have significant deficiencies with regard to understanding how to assess the authority of research materials.

A recent research survey on the language of information literacy for Grand Valley State University students had similar findings. The schools' liaison librarians often use

terms such as 'peer reviewed articles' and 'scholarly source' when training students on how to find information; however, "even when these terms are defined in class, students do not understand or retain the meaning of these concepts" (Schaub, Cadena, Bravender, & Kierkus, 2017, p. 288). The ACRL's (2015a) *Framework* states that such "information may be perceived differently based on the format in which it is packaged" (p. 5). Thus, according to the ACRL's *Framework*, graduate students should be able to recognize the type of materials and "that authoritative content may be packaged formally or informally and may include source of all media types" (p. 4). The current research indicates that the participants need more training for basic bibliographic skills. Question 13's results support this consideration as only 51 participants knew how to use advance search. In addition, the current study explored search strategy abilities and found that less than 50% of participants knew how to use periodical databases or select the correct set of search terms. Furthermore, 21.6% of participants did not know how to use the Boolean Logic Search and some lacked knowledge of bibliographic strategies, such as including synonyms and related terms for the concepts, subjects, and keywords used to find resources via search engines.

Regarding the knowledge of citation, 25% of participants chose correct answers for each of the questions in the category of citation. The survey questions emphasized identifying the materials' format and reference requirement for citation in the articles. The participants struggled most with questions about investigating the reputation of the websites and some of the APA style requirements. These kinds of skills should be imbedded in a librarians' information literacy training guide. The results were similar for

Fair Dealing: 23% of participants knew about the concepts associated with Canadian copyright laws, such as Fair Dealing.

Participants' Information Seeking Preferences

With respect to information seeking preferences, the focus group results showed that most of the participants preferred using Google Scholar and its resources rather than the library's integrated library system and its electronic resources as primary sources. The participants were familiar with Google Scholar, and they mentioned that Google Scholar has many advantages for academic research. For example, participants reported that Google Scholar is easy to use, has "cited by" and "Get it" features, offers an efficient spell-checker, applies Boolean logic applications, and offers a far more comprehensive database than anything available through the library. This is supported by Tanya Cothran, who outlines several reasons that "influence graduate students' intention to use Google Scholar, including students' perceived usefulness of Google Scholar, their sense of loyalty towards that search engine, and its perceived ease of use" (as cited in Shen, 2012, p. 96). Most recently, Deans and Durrant (2016), Zientek et al. (2018) and Greenberg (2018) reported similar situation in academic libraries. These studies observed that "today's students are more familiar with using search engines via the Internet rather than a scholarly database prescribed by their institution for research purposes" (Deans & Durrant, 2016, p. 257).

Challenges of Graduate Students Using Electronic Resources

Regarding the challenges that graduate students encounter when searching for appropriate electronic collections for their research, this study identified several issues, such as how to use subscription electronic resources, how to understand the difference in

search results between Google Scholar and Primo, as well as how to be aware of and willing to obtain the library's information literacy services.

Understanding for Subscription Electronic Resources

Study participants used Google Scholar more often for their research than they did the library's electronic subscription collection, and they often did not understand how to use the latter. Understanding the subscription electronic resources is one of the challenges for the participants. In real practice, each of the electronic resources interface and search methods have significantly different functionalities and unique methods for search and retrieval. For example, in terms of the search method, within the same vendor's products, the ProQuest database's search method is different than the ProQuest electronic journal platform. In terms of the electronic resource holdings—issues coverage—the electronic resources platform's holdings display is a big issue because most of the electronic resources are managed by the knowledge base, like Ex Libris Alma. Some journals' holdings information is displayed incorrectly, which misleads the users. In terms of the full article links on the EBSCO Electronic Journal Services platform, within the same result page, some are available via EBSCO's website, while others are only available on the publisher's site (Figure 10). This can cause problems for full-text access. Because of the electronic resources' implementation issues, academic libraries are improving their websites' design and monitoring the use of their electronic collections to make the latter more understandable and accessible to the students. Academic libraries are using discovery systems such as Primo; to make research materials more easily searchable, this accessibility shift includes electronic resources, databases, and institutions' open access repositories to their libraries' websites. Dabin and Preminger note that "discovery

systems (DS) harvest metadata from various sources into one central index" and that "This data can be searched through thanks to an intuitive interface, which also redirects users to full text resources in their native databases" (2018, p. 37).

Sohail and Ahmad (2017) explored the use of electronic resources and services in Fiji National University and found that some "students complained that slow downloading is a problem they faced with accessing the internet," so they thought that "e-resources and services need to be harnessed and utilized properly" and that libraries services "based on management principles need to be renewed frequently keeping in view the changing requirements of the users" (p. 170). Similarly, the International Federation of Library Associations and Institutions ([IFLA], 2012) outlines key issues pertaining to e-resources collections:

> Electronic resources also present a number of technical issues that need to be considered to ensure resources are compatible with existing library hardware and software that the library has the capability to provide and effectively maintain access to resources on an ongoing and cost-effective basis. (p. 8)

These are challenges for both libraries and students. To meet this need for more effective management of and accessibility to electronic resources, libraries require more modern infrastructure and services. This would increase the benefits of electronic resources, creating an environment that addresses and supports the unique needs of contemporary students.

Figure 10. Journal's linking issue.

Understanding for Primo versus Google Scholar

This research results highlight the participant's lack of the knowledge with regard to Primo. In Ontario, most of the OCUL libraries use Ex Libris products, such as Alma/Primo, a centralized repository of information services environment: this is called the Central Knowledge Bases, and it is used to capture e-resources and make them available in the scholarly environment. The Central KnowledgeBase (CKB) describes vendor offerings for electronic resources and is maintained by Ex Libris (Ex Libris, 2019). These electronic resources display in Primo, Ex Libris (2017) defines Primo as "a single search interface [that] provides a gateway to a wealth of scholarly content, including print, electronic and digital collections" (p. 1). They go onto note that "Primo's sophisticated search and relevance ranking algorithm ensures the most relevant results, based on the content of the search and the user's profile" (p. 1). A library's collections includes the library's subscripted electronic packages and databases that appear in Primo's results, and Primo also appear the Institution Repository materials and some of the open access materials. Primo offers a

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one-step search portal that allows users to simultaneously search across the library's

resources, such as books, journals, theses, and research output. Primo's layouts differ

from Google Scholar, and some of the searching features, such as spell-check, are not yet

available. In addition, Primo has its own database (Primo Center Index, PCI) and is

centrally controlled by Ex Libris. Primo's member libraries are managed by Primo Center

Index (PCI), which organizes content differently. Furthermore, some of the databases do

not appear in Alma's Central Knowledge Base, even those that are already in Primo.

When the databases are called up, the user is required to type the search term a second

time. Moreover, each database has its own search method, and users from different

disciplines need to understand the databases' unique search functions for their platforms.

      With respect to knowledge of the library's electronic resources services, only a

few of the focus group participants knew how to rectify problems they encountered when

accessing online resources. One participant used the troubleshooting system, which most

participants in the focus group did not know about. This function is currently located at

the bottom of the search result page with a small blue font. Although this service is

supposed to be helpful to students so that they may be able to obtain the materials they

need for their research, the function is less than optimally accessible to users by its

current location on the Intergraded Library System (ILS). Figure 11 illustrates the

"additional services" function: when students have a problem accessing the library's

collection, they can just click on the "Report A Problem" button. A pop-up window

(Figure 12) will then appear, at which point the students need to provide the information

requested in the window. After the report is sent within one business day (except

weekends and holidays), the inaccessible electronic resources issues will be solved by the

library staff and the user will either receive the requested material directly, or they will

receive instructions on how to obtain the requested material. However, this service is not

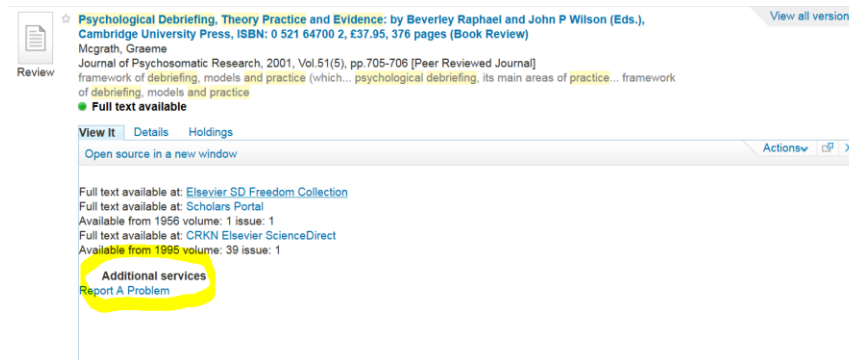commonly used by the students when they encounter research problems.

Figure 11. Troubleshooting services.

Figure 12. The box for reporting problems.

Although study participants relied heavily on Google Scholar, they did not

express a thorough understanding of its limitations. For example, Google Scholar does

not offer everything that a researcher needs, and the free journal articles may not provide

current year issues. Moreover, Google Scholar does not indicate whether an article was

peer-reviewed. Thus, students have to evaluate this on their own, and given that most

participants were unable to do this, there are some potential issues with it. In addition,

when using Google Scholar as a primary search engine, most current journal articles request payment, meaning a second search for a library's website may be needed. To get around this situation, libraries are working diligently to make electronic collections accessible through Google Scholar.

Given this challenge, libraries need to ensure that access to electronic resources is easy, effective, and efficient for all students. To this end, the library's homepage should streamline their software search functions, shifting from multiple search to 'one-stop-search' such as from 'journal title search' to 'article title search'. In addition, recently, Primo has added a "cited by" advanced search option similar to that of Google Scholar to further promote ease of access (Figures 13 and 14). Through these changes, the library's web page is able to make searching, locating, and using the library's electronic resources more efficient, which may encourage more students to use the library web page and Primo. Furthermore, since most of the library's subscription database and electronic collection packages can be found in Google Scholar, it may can alleviate some of the electronic resources access issues that participants expressed concerns about.
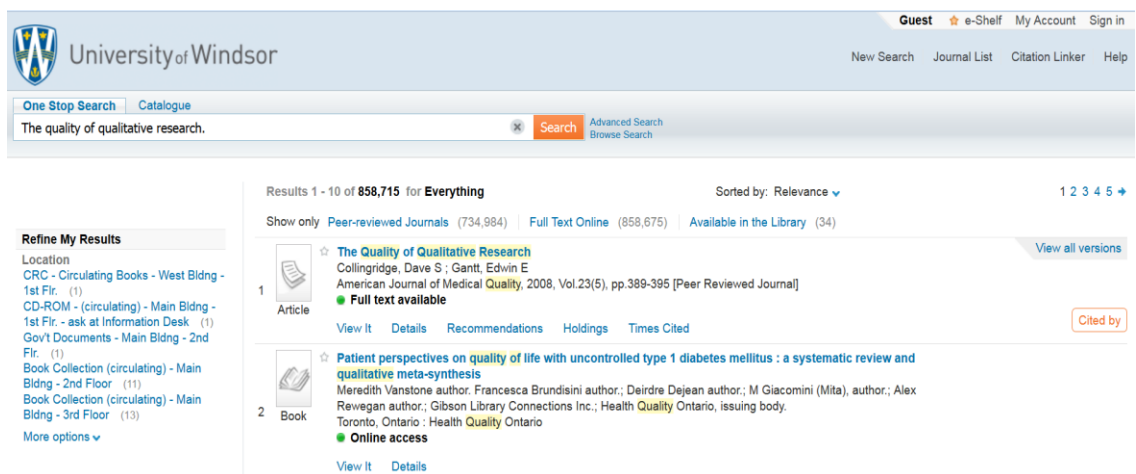

Figure 13. "Cited by" in Primo.

Figure 14. "Cited by" in Primo (detail).

Professional Supports for Graduate Students' Research

Librarians and faculty members are playing different but equally important roles when helping the graduate students develop information literacy skills. In terms of information literacy training, Jackson (2017) strongly endorses collaboration between librarian and faculty. Librarians can play an essential role in conducting information literacy training and reference help, while faculty members can encourage students to use the library resources. When working jointly to this end, it is more likely that students will obtain the information literacy skills required to successful complete their research.

Library Support

This is supported by Benjamin and McDevitt (2018), who note that individuals who underwent training to be library peer mentors at the reference desk and in the classroom reported that their "work experience had resulted in improved reference skills, which positively impacted academic work, and also that they appreciated the increased responsibilities provided by the positions" (p. 257). At the University of Windsor, librarians provide a variety of information literacy training for their students, such as information literacy instruction, information literacy services, and information literacy documents (see Figure 15). However, despite providing these resources, the current

study's participants did not possess adequate information literacy skills. Many study participants were not aware of or did not attend the service the library provided.

This finding suggests that there may be some issues with the delivery of the library's supports. According to the ACRL's (2015b) *Framework*, graduate students should have a proficient understanding of six information literacy concepts, and librarians are responsible for teaching students about these concepts. In academic libraries, there are multiple versions of the information literacy training guides that are each shaped by librarians' understanding of the ACRL's *Framework,* as well as the library's information literacy policy. Moreover, librarians may describe electronic collections and databases differently depending on their understanding of them. These may impact the training quality for students who are obtaining information literacy skills from the librarians. The researcher generated this Figure 15 as basic information literacy practices; it may help to understand how to support students to obtain the quality training from academic libraries.
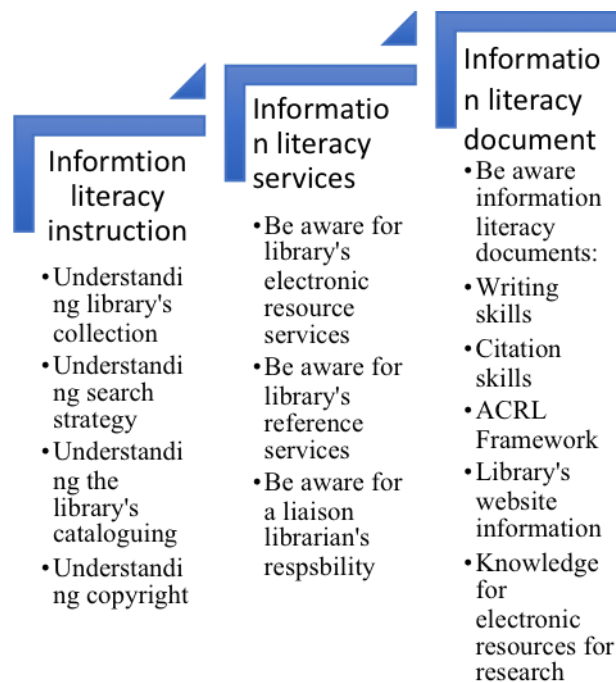

Figure 15. Information literacy training practices.

Faculty Support

With regard to Question 15, which aimed to test the students' knowledge about scholarly sources, only 42.7% chose the right answer. This was consistent with the findings of Perry (2017), who investigated information literacy teaching among science faculties. She found that "faculty used a variety of techniques to assist students with their research skills" but that the "instruction provided by the faculty varied widely, from limited class time spent on developing research skills, to multiple in-depth activities across the semester to engage students deeply in the literature" (p. 970). Her research indicates that information literacy sessions offered by librarians and faculty members used varied ways to teach their students information literacy skills. Interesting examples included having students do assignments to develop their research skills; however, Perry's (2017) results indicate that the students failed to meet faculty expectations for information literacy skills. She wrote that where "students most commonly fell short was in the evaluation of sources, often selecting sources that were inappropriate or lacking in rigor (50%)" (p. 969). This is consistent with the findings of the current study, demonstrating that even when faculty members contribute to information literacy training, some of students may be still not obtain appropriate information literacy skills (Perry, 2017).

Implications for Practice

Over the last decade, academic libraries' electronic collections have greatly increased, and the "information available in print and on the Internet range widely in scholarliness and quality, yet electronic dissemination is generally preferred due to the freedom from temporal and geographic restrictions" (Beile O'Neil, 2005, p. 127). To

address this gap in understanding between print and electronic resources, and how it influences the quality of graduate students' research, it is important to examine their information literacy skills.

This research shows that graduate students, when surveyed about their information literacy skills, did not score high. Most of the participants understood the use of electronic resources, but they did not fully understand how to search for them in an in-depth way. For example, the searching database "Emerald Insight" requires students to learn different and more involved searching strategies than may be used elsewhere, and this challenge may lead the students prefer using Google Scholar for their research.

The survey also revealed that library instruction sessions were not well attended for the three kinds of training ways which were available to students. These include the library orientation sessions, the in-class instruction sessions, and one-on-one training. The attendance scores for library orientation and one-on-one sessions were lower than instruction session held in the classroom. The low attendance of any library instruction sessions showed that the students missed opportunities to obtain information literacy skills. Moreover, the focus group results suggest that even participants who did attend the information literacy trainings still had difficulty effectively using the electronic resources provided by the library.

Furthermore, the research results indicate that there is no significant difference between "Information Literacy Assessment" with the other four categories including Search Strategy, Knowledge of Electronic Resources, Citation, and Ethical Considerations & Copyright. The assessment questions tested that the participants knowledge to determine whether they could "recognize that authoritative content may be

packaged formally or informally and may include sources of all media types" (ACRL, 2015b, p. 4). However, the Pearson Correlations results showed that students were not able to recognize the depth by which "information creations are valued differently in different contexts, such as academia or the workplace" (ACRL, 2015b, p. 5). The current study's survey results demonstrate that participants were only able to use the surface information that was available.

These findings may set a foundation of understanding upon which librarians can explore new ways of teaching students about information literacy skills. Librarians could create a training guide for students to help them with their research skills that conforms to the ACRL Search as Strategic Exploration threshold concept (2015b). This highlights the need to change the information literacy teaching model. One suggestion is that when information literacy classes are offered, they need to be packaged as more than only 'one session'. Perhaps they need to establish a credit course that would involve a multi-session or series approach. Furthermore, to address these gaps in information literacy, librarians should work with faculty to develop not only a series of information literacy classes but also a general information literacy training guide following the ACRL *Framework*. This would help faculty understand the scope of work that librarians can contribute to.

Establishing a Credit Course for Information Literacy

This study suggests that most of the participants either did not attend the library instruction session, and/or were not aware of it. Moreover, when they did go, they still had problems using electronic resources. The results also show that 56.6% of participants attended library instruction sessions held in the classroom, which was significantly higher

than the 34.4% who attended an orientation held in the library, and the 18.9% who attended one-on-one information literacy training. This indicates that students will attend the training if it becomes part of curriculum requirement. Also, participants who attended the session's library offered still had problem with their understanding and searching of information. This sets up a request to change the content and format of library sessions.

As an alternative way for information literacy training, a mandated credit course could be created that focuses on information literacy to ensure the six threshold concepts outlined in the framework are understood by students. Cohen et al. (2016) conducted a survey on an information literacy credit course in USA and found that 19% of institutions have an information literacy credit course taught by librarians. The majority of these courses are undergraduate electives comprised of 1-2 credit hours and are offered under the library aegis, although a significant minority required 3-4 credit hours and were taught by another academic department or campus-wide program. The University of Windsor should learn from universities that have practiced the credit course option and set up their own, more formal information literacy training for students.

Study Limitations and Implications for Future Research

Though the current study offers a number of important insights, it does have some limitations related to oversight, inexperience, and some logistical restrictions.

Study Limitations

The researcher intended to determine if there was a correlation between participants' attendance of library instruction session and their information literacy skills. Most of the online survey participants did not attend the library instruction session, and

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only one participant mentioned using the library's troubleshooting system. Therefore, this intention was not realized.

Since the participants were graduate students, some of them had studied at other universities. As alumni of other post-secondary institutions, they still had access to and utilized their previous universities' databases. This phenomenon was not considered in the study design. Although the results can still measure participants' information literacy skills, it would not be an accurate representation of all graduate students' information literacy skills with respect to the use of the library's electronic resources at the University of Windsor.

Although the researcher tried different strategies to promote the online survey among FHASS graduate students, only 136 students completed the online survey. The participation rate was 23.18%. Consequently, only partial data was collected; thus, the study cannot concretely answer the three research questions that it set out to investigate. Since the response rate was relatively low, this research could not make broad generalizations as to the challenges graduate students encounter or the information literacy status of all graduate students. However, librarians and faculty members can still benefit from these results since the research was able to explore the possibilities of what those challenges could be. A larger sample could yield more concrete results.

Future Research Development

Developing an understanding of graduate students' information literacy skills under the ever-changing research environment is an ongoing process. This study identified the low attendance of library instruction sessions as an emerging issue. Students may not believe information literacy training has value, and this needs to be

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address by librarians. Students believe they can research effectively, but survey data suggests that these students have grossly overestimated their abilities and that many likely do not possess the skills required to conduct effective research at the graduate level. This information can help librarians understand which approaches they can use in the classroom. Furthermore, librarians can begin to dispel some student beliefs and use these beliefs as a way to teach the threshold concepts. The rate of attendance for in-class training was higher than both sessions hosted by the library as well as one-on-one training. Future research can investigate this attendance issue for information literacy training. This study raises a need for a credit course for information literacy training. Its design, delivery, and effectiveness will be critical topics for future research.

The ACRL *Framework* lists six threshold concepts: (1) authority is constructed and contextual, (2) information creation as a process, (3) information has value, (4) research as inquiry, (5) scholarship as conversation, and (6) searching as strategic exploration. In this study, the five categories of information literacy skills are closely correlated with each other, excepting "Information Literacy Assessment". This raises a concern as to whether this a unique phenomenon to University of Windsor students. If future research finds that this is more common issue, it is important to determine how and why this is taking place and how information literacy training can cover all information literacy component including assessment.

Conclusion

This research found that many graduate students' information literacy status is not satisfactory. The majority of participants were unaware of many elements of the library's information literacy services, such as its training sessions. Neither did the participants

understand the library's electronic resources. Consequently, they preferred using Google Scholar rather than the library's integrated system; however, they expressed confusion regarding requested payments for many of the articles found via Google Scholar. Overall, the research findings suggest that students lack information literacy skills.

The study also identified some current issues encountered by graduate students with regard to information literacy, as well as challenges associated with the professional support provided by the library and faculty. The results offer important insights for practice. For example, students may need more than one session to understand the research concepts more clearly and apply them to their work. In addition, librarians should explore how they can incorporate the threshold concepts that can guide the teaching of information literacy skills. This multi-session librarian training would be a necessary first move to developing students' academic research skills. Furthermore, a credit course may be an alternative format to pursue for a university.

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Beile Test of Information Literacy for Education (B-TILED)
(Beile O'Neil, 2005, p. 196-204)

The library is gathering information to evaluate the effectiveness of its instruction program.

This questionnaire consists of demographic questions and a library and information skills quiz.

Fill in the most correct choice on your Scantron form.

1. Overall, how would you rate your ability to search library databases to find information?
   a. excellent
   b. good
   c. average
   d. poor

2. Overall, how would you rate your ability to search the Internet to find information?
   a. excellent
   b. good
   c. average
   d. poor

Please indicate whether you have attended any of the following since you began your studies at UCF.

3. Have you attended a tour or physical orientation of the library?
   a. yes
   b. no
   c. don't know

4. Have you attended a library instruction session held in your classroom?
   a. yes
   b. no
   c. don't know

5. Have you attended a library instruction session held in the library?
   a. yes
   b. no
   c. don't know

6. Have you had one on one intensive instruction with a librarian?
   a. yes
   b. no
   c. don't know

7. Which of the following characteristics best indicates scholarly research?
    a. available in an academic library
    b. indexed by ERIC
    c. reviewed by experts for publication
    d. written by university faculty

*8. Your professor has assigned a paper on the whole language movement. You are not familiar with the topic, so you decide to read a brief history and summary about it. Which of the following sources would be best?
    a. a book on the topic, such as *Perspectives on whole language learning: A case study*
    b. a general encyclopedia, such as *Encyclopedia Britannica*
    c. an article on the topic, such as "Whole language in the classroom: A student teacher's perspective."
    d. an education encyclopedia, such as *Encyclopedia of Education*

9. Research or periodical databases are designed to include items based on which of the following criteria?
    a. found on the Internet
    b. not found on the Internet
    c. owned by your library
    d. relevant subject matter

***10**. ERIC is the most appropriate database to search to locate:
    a. education article citations and documents
    b. education publications from 1877 to current
    c. full-text education articles
    d. US Department of Education statistics

11. Most research and periodical databases have basic and advanced searching interfaces. Which of the following can you do ONLY in advanced searching?
    a. add Boolean or search connectors between terms
    b. enter multiple search terms
    c. search by keyword
    d. search multiple terms by field

12. Research studies in education are generally first communicated through:
      a. books published by education associations
      b. education encyclopedia entries
      c. newsletters of education associations
      d. professional conferences and journal articles

13. You have been assigned to write a short class paper on effective instruction techniques for teaching English as a Second Language (ESL) students. Your professor indicated three recent scholarly sources would be sufficient. Which strategy is best to locate items?
      a. search a general academic and an education database for journal articles
      b. search an education database for journal articles
      c. search the library catalog for books
      d. search the library catalog for encyclopedias

14. Select the set of search terms that best represent the main concepts in the following: What are the health risks associated with the use of drug therapy for hyperactive students?
      a. drug therapy, health risks, hyperactivity
      b. drug therapy, health risks, students
      c. drug therapy, hyperactivity, students
      d. drugs, hyperactivity, therapy

15. Select the set that best represents synonyms and related terms for the concept "college students."
      a. colleges, universities, community colleges…
      b. Gen X, students, undergraduates…
      c. graduate students, freshmen, sophomores...
      d. university, adult learners, educational attendees...

16. While researching a paper on character education, you find that it is also sometimes called *values education* or *moral education*. You decide to look for information on the subject in a research database, and to save time you write a search statement that includes all three terms.
Which of the following is the best example to use when you have fairly synonymous terms and it does not matter which of the terms is found in the record?
      a. character and values and moral
      b. character or values or moral
      c. character, values and moral
      d. character, values or moral

17. You are using a research database that uses an asterisk (*) as its truncation symbol. When you type in *read** you would retrieve records that contained which of the following words?
        a. examine, peruse, reader, reading
        b. peruse, read, reader, reading
        c. read, reader, reads, readmit
        d. read, reader, reading, reapply

ACRL Performance Indicator 3.7.2.1

*18. You have a class assignment to investigate how group work impacts student learning. A keyword search in ERIC on "group work" has returned over 600 items. To narrow your search, which of the following steps would you next perform?
        a. add "impacts" as a keyword
        b. add "student learning" as a keyword
        c. limit search results by date
        d. limit search results by publication type

ACRL Performance Indicator 2.3.1.3

19. The following citation is for:
Massaro, D. (1991). Broadening the domain of the fuzzy logical model of perception. In H. L. Pick, Jr., P. van den Broek, & D. C. Knill (Eds.), *Cognition: Conceptual and methodological issues* (pp. 51-84). Washington, DC: American Psychological Association.
        a. a book
        b. a chapter in a book
        c. a journal article
        d. an ERIC document

ACRL Performance Indicator 2.2.4.1

20. Your professor suggested you read a particular article and gave you the following citation:

Shayer, M. (2003). Not just Piaget, not just Vygotsky. *Learning and Instruction, 13*(5), 465-485.

Which of the following would you type into the library's catalog to locate the actual article?
        a. author search: Shayer
        b. journal title search: *Learning and Instruction*
        c. journal title search: Not just Piaget, not just Vygotsky
        d. subject search: Piaget and Vygotsky

21. The following item was retrieved from an ERIC database search. What kind of source is it?

Title: Pre-service Elementary Teachers' Self-Efficacy Beliefs
Author(s): Cakiroglu, Jale; Boone, William J.
Publication Year: 2001
Abstract: The purpose of this study was to examine pre-service elementary teachers' self-efficacy beliefs in teaching science.

Notes: Presented at the Annual Meeting of the American Educational Research Association
(Seattle, WA, April 10-14, 2001).
Number of Pages: 24
ERIC Number: ED453084

> a. a book
> b. a book chapter
> c. a conference paper
> d. a journal article

22. Using this result from an Internet search engine, who is the "owner" of this Web site?
State policies on planning, funding, and standards. Does the state have technology requirements for students?

http://www.edweek.org/reports/tc98/states/fl.htm
> a. business or commercial entity
> b. college or university
> c. other organization
> d. state government agency

*23. While developing a lesson plan on the U.S. legislative system, you find the following story on the Internet:

Congress Launches National Congress-Awareness Week
WASHINGTON, DC—Hoping to counter ignorance of the national legislative body among U.S. citizens, congressional leaders named the first week in August National Congress Awareness
Week. "This special week is designed to call attention to America's very important federal lawmaking body," Speaker of the House Dennis Hastert said. The festivities will kick off with a
10-mile Walk for Congress Awareness.
The item is from a newspaper Web site, which states it is "America's Finest News Source."
Given this, the following action is in order:

a. you can use the story as it's obviously from a reputable news source
b. you decide to investigate the reputation of the publisher by looking at their Web site
c. you decide to investigate the reputation of the publisher by looking at other Web sites
d. you should not use the story because Web information is not always trustworthy

ACRL Performance Indicator 5.2.6

24. Based on the following paragraph, which sentence should be cited?

(1)Technology use in the schools is often characterized as a potentially dehumanizing force.
(2)Perhaps the fear that the virtual world may lead to passivity and isolation, at the expense of literal social interaction, is valid.
(3)Certainly, educators must ask *which* uses of technology result in increased learning and a better quality of life.
(4)To address these issues, Hunter has proposed that students work in groups with the computer peripheral to the group and the teacher acting as facilitator.

a. 1
b. 2
c. 3
d. 4

ACRL Performance Indicator 5.1.4

25. When is it ethical to use the ideas of another person in a research paper?
a. it is never ethical to use someone else's ideas
b. only if you do not use their exact words
c. only when you give them credit
d. only when you receive their permission

ACRL Performance Indicator 5.1.4

*26. You are planning an open house for your students' parents. Browsing the Internet, you find the report *Child Safety on the Internet*, which is a US Department of Education publication. If you distribute 30 copies of the report to parents at the open house, which of the following copyright choices is the proper action?
a. permission is not needed as the report is from a government agency.
b. permission is not needed as the report was found on the Internet.
c. permission is not needed as you are only distributing 30 copies.
d. permission to distribute 30 copies of the report must be acquired.

ACRL Performance Indicator 5.2.5

27. You have an assignment that requires you to use course management software to practice setting up a class grade book. Your school has purchased the software and loaded it in the computer lab, but you have a difficult time getting to the lab due to work conflicts. A friend loans you the software and you load it on your computer. Is this legal?
> a. no, because this action constitutes a violation of copyright.
> b. yes, because it is already freely available in the lab.
> c. yes, because it is education software and therefore able to be shared.
> d. yes, because your friend owns it and can share as he wants.

ACRL Performance Indicator 5.1.4

28. Browsing a weekly news magazine, you come across an article that discusses the future of space exploration. As you are teaching this topic you decide to make copies of the article and share it with your class. Which of the following concepts makes it legally permissible to reproduce portions of works for educational purposes without permission?
> a. copyright
> b. fair use
> c. freedom of information
> d. intellectual freedom

29. Which of the following most closely describes the level you want to teach?
> a. early childhood
> b. elementary
> c. middle school
> d. high school

30. What is your student classification?
> a. freshman
> b. sophomore
> c. junior
> d. senior

31. How long have you been continuously enrolled at UCF?
> a. less than 1 year
> b. 1 to 2 years
> c. 3 to 4 years
> d. more than 4 years

32. Have you ever attended another university or college?
> a. yes (go to question 33)
> b. no (skip to question 34)

33. How long ago did you attend another university or college?
> a. 0-1 year
> b. 2-3 years
> c. 4-5 years
> d. more than 5 years

34. What is your gender?
        a. male
        b. female

35. Please indicate those racial or ethnic groups that apply to you.
(Select all that apply.)
        a. White or European American
        b. Hispanic or Latino
        c. Black or African American
        d. Asian or Asian American
        e. Other (write in on Scranton)

Thank you!

Test Key

7. C
8. D
9. D
10. A
11. D
12. D
13. B
14. A
15. C
16. B
17. C
18. B
19. B
20. B
21. C
22. C
23. C
24. D
25. C
26. A
27. A
28. B

APPENDIX B

Modified Survey Questionnaire

The library is gathering information to evaluate the effectiveness of its instruction program.

This questionnaire consists of demographic questions and a library and information skills quiz.

Demographic Information

1. What is your gender? _____

2. Please indicate which language(s) you normally speak at home: _____

3. Please indicate your level of graduate status
    a. Master
    b. Doctorate

4. Please indicate your program of study
    a. Communication and Social Justice
    b. Criminology
    c. Film & Media Arts
    d. English
    e. History
    f. Philosophy
    g. Political Science
    h. Psychology
    i. Social Work
    j. Sociology
    k. Visual Arts

5. How long have you been continuously enrolled at University of Windsor as a graduate student?
    a. one semester or less than 1 year
    b. 1 to 2 years
    c. 3 to 4 years
    d. more than 4 years

6. Have you ever attended another university or college?
    a. no, I have never attended another university
    b. yes, I finished my undergraduate degree at an institution other than the University of Windsor
    c. yes, but I transferred to the University of Windsor to finish my   undergraduate degree

Knowledge of Library Services

Please indicate whether you have attended any of the following since you began your studies at University of Winder.

7. Have you attended an orientation of the library?
      a. yes
      b. no
      c. not aware of it

8. Have you attended a library instruction session held in your classroom?
      a. yes
      b. no
      c. not aware of it

9. Have you had one on one intensive organized instruction with a librarian?
      a. yes
      b. no
      c. not aware of it

10. Have you used the troubleshooting system (i.e., elecprod@uwindsor.ca) when you use the library's electronic resources?
      a. yes
      b. no
      c. not aware of it

Search Strategy

11. Overall, how would you rate your ability to search library databases to find information?
      a. excellent b. above average c. average d. below average   e. poor

12. Overall, how would you rate your ability to search the Internet to find information?
      a. excellent   b. above average   c. average   d. below average   e. poor

13. Most research and periodical databases have basic and advanced searching interfaces. Which of the following can you do ONLY in advanced searching?
      a. add Boolean or search connectors between terms
      b. enter multiple search terms
      c. search by keyword
      d. search multiple terms by field

14. Research studies in arts, humanities and social sciences are generally first communicated through:
      a. books published by arts, humanities and social sciences associations
      b. arts, humanities and social sciences encyclopedia entries
      c. newsletters of arts, humanities and social sciences associations
      d. professional conferences and journal articles

15. You have been assigned to write a short class paper on effective instruction techniques for a Creative Writing Project. Your professor indicated three recent scholarly sources would be sufficient. Which strategy is best to locate items?
    a. search a general academic and an arts, humanities and social sciences database for journal articles
    b. search an arts, humanities and social sciences database for journal articles
    c. search the library catalog for books
    d. search the library catalog for encyclopedias

16. Select the set of search terms that best represent the main concepts in the following. What are the health risks associated with the use of drug therapy for hyperactive students?
    a. drug therapy, health risks, hyperactivity
    b. drug therapy, health risks, students
    c. drug therapy, hyperactivity, students
    d. drugs, hyperactivity, therapy

17. Select the set that best represents synonyms and related terms for the concept "college students."
    a. colleges, universities, community colleges…
    b. Gen X, students, undergraduates…
    c. graduate students, first years, second years...
    d. university, adult learners, educational attendees...

18. While researching a paper on *First Nations*, you find that these populations are also sometimes called *Native Americans* or *Indigenous* populations. You decide to look for information on the subject in a research database, and to save time you write a search statement that includes all three terms. Which of the following is the best example to use when you have fairly synonymous terms and it does not matter which of the terms is found in the record?
    a. First Nations and Indigenous and Native Americans
    b. First Nations or Indigenous or Native Americans
    c. First Nations, Indigenous, and Native Americans
    d. First Nations, Indigenous, or Native Americans

19. You are using a research database that uses an asterisk (*) as its truncation symbol. When you type in *read** you would retrieve records that contained which of the following words?
    a. examine, peruse, reader, reading
    b. peruse, read, reader, reading
    c. read, reader, reads, readmit
    d. read, reader, reading, reapply

20. You have a class assignment to investigate how group work impacts student learning. A keyword search in JSTOR on "group work" has returned over 19,000 items. To narrow your search, which of the following steps would you next perform?
   a. add "impacts" as a keyword
   b. add "student learning" as a keyword
   c. limit search results by date
   d. limit search results by publication type

21. Your professor has assigned a paper on the whole language movement. You are not familiar with the topic, so you decide to read a brief history and summary about it. Which of the following sources would be best?
   a. a book on the topic, such as *Perspectives on whole language learning: A case study*
   b. a general encyclopedia, such as *Encyclopedia Britannica*
   c. an article on the topic, such as "Whole language in the classroom: A student teacher's perspective."
   d. a subject specific encyclopedia, such as *Encyclopedia of Psychology*

Knowledge of Electronic Resources

22. Which of the following characteristics best indicates scholarly research?
   a. available in an academic library
   b. indexed by JSTOR
   c. reviewed by experts for publication
   d. written by university faculty

23. Research or periodical databases are designed to include items based on which of the following criteria?
   a. found on the Internet
   b. not found on the Internet
   c. owned by your library
   d. relevant subject matter

24. JSTOR is the most appropriate database to search to locate:
   a. journals, reviews, and articles relating to the humanities, social sciences and literature; includes back issues.
   b. social sciences publications from 1877 to current
   c. full-text articles solely relating to biology
   d. entire e-books

Information Literacy Assessment

25. You are writing a paper on the Black Lives Matter movement and your professor asks you to include a current primary source, which of the following would fulfill this criteria?
   a. Toronto Sun article from July 2015 describing one of the protests
   b. a book written by one of the activists that started the movement

c. a WordPress website discussing the Black Lives Matter movement in Toronto
d. a referred journal article on racism from the 1960s

26. You are asked to find a work of American Poetry to bring to class next week, which database would offer access to this information?
   a. Literature Online
   b. Science Direct
   c. Project Muse
   d. Historical Abstracts

27. How can you determine that a book contains relevant information on your topic?
   a. the title includes any of the words from your search
   b. the table of contents lists a chapter on your topics
   c. the topic is listed in the index
   d. the author has written books on your topic before

Citation

28. The following citation is for:

Massaro, D. (1991). Broadening the domain of the fuzzy logical model of perception. In H. L. Pick, Jr., P. van den Broek, & D. C. Knill (Eds.), *Cognition: Conceptual and methodological issues* (pp. 51-84). Washington, DC: American Psychological Association.

   a. a book
   b. a chapter in a book
   c. a journal article
   d. a website

29. Your professor suggested you read a particular article and gave you the following citation. Which of the following would you type into the Leddy Library's One Stop Search to locate the actual article?

   Morren, & Grinstein. (2016). Explaining environmental behavior across borders: A meta-analysis. *Journal of Environmental Psychology, 47*, 91-106.

   a. author search: Morren
   b. journal title search: *Journal of Environment Psychology*
   c. article title search: Explaining environmental behavior across borders: A meta-analysis
   d. subject search: environmental behavior

30. The following item was retrieved from ACM Digital Library. What kind of source is it?
   Title: Computers and modern art: digital art museum
   Author(s): Mike King
   Published in: C&C '02 Proceedings of the 4th conference on Creativity & cognition
   Publication Year: 2002

Note: Presented at Creativity and Cognition (Loughborough, UK — October 13 - 16, 2002).

a. a book
b. a book chapter
c. a conference paper
d. a journal article

31. You are a graduate assistant for an undergraduate political science class. While developing a lesson plan on the U.S. legislative system, you find the following story on the Internet:
    Congress Launches National Congress-Awareness Week
WASHINGTON, DC—Hoping to counter ignorance of the national legislative body among U.S. citizens, congressional leaders named the first week in August National Congress Awareness Week. "This special week is designed to call attention to America's very important federal lawmaking body," Speaker of the House Dennis Hastert said. The festivities will kick off with a 10-mile Walk for Congress Awareness.

    The item is from a newspaper Web site, which states it is "America's Finest News Source."

    Given this, the following action is in order:

    a. you can use the story as it's obviously from a reputable news source
    b. you decide to investigate the reputation of the publisher by looking at   their Web site
    c. you decide to investigate the reputation of the publisher by looking at   other Web sites
    d. you should not use the story because Web information is not always trustworthy

32. Which of the following sentence must add reference?
    a. Technology use in the schools is often characterized as a potentially dehumanizing force.
    b. Perhaps the fear that the virtual world may lead to passivity and isolation, at the   expense of literal social interaction, is valid.
    c. Certainly, educators must ask which uses of technology result in increased learning and a better quality of life.
    d. To address these issues, Hunter has proposed that students work in groups with the computer peripheral to the group and the teacher acting as facilitator.

Ethical Considerations & Copyright

33. When is it ethical to use the ideas of another person in a research paper?
    a. it is never ethical to use someone else's ideas
    b. only if you do not use their exact words
    c. only when you give them credit
    d. only when you receive their permission

34. You are a graduate assistant and preparing a document for class. Browsing the Internet, you find a report regarding First Nations populations in Canada on the Internet, which is an Indigenous and Northern Affairs Canada's publication. If you distribute 30 copies of the report to students in the class, which of the following copyright choices is the proper action?

 a. permission is not needed as the report is openly available from the government agency's website.
 b. permission is not needed as the report was found on the Internet.
 c. permission is not needed as you are only distributing 30 copies.
 d. permission to distribute 30 copies of the report must be acquired.

35. You have an assignment that requires you to use course management software to practice setting up a class grade book. Your library has purchased the software and loaded it on to the computers in the computer lab. Due to work conflicts, you have a difficult time getting to the lab. A friend loans you the software and you load it on to your personal computer. Is this legal?

 a. no, because this action constitutes a violation of copyright.
 b. yes, because it is already freely available in the lab.
 c. yes, because it is educational software and therefore able to be shared.
 d. yes, because your friend owns it and can share as he wants.

36. Browsing a weekly news magazine, you come across an article that discusses the future of space exploration. As you are teaching this topic you decide to make copies of the article and share it with your class. Which of the following concepts makes it legally permissible to reproduce portions of works for educational purposes without permission?

 a. copyright
 b. fair dealing
 c. freedom of information
 d. intellectual freedom

Thank you!

Test Key

13. D
14. D
15. B
16. A
17. C
18. B
19. C
20. B
21. D
22. C
23. D
24. A

25. A
26. A
27. B
28. B
29. C
30. C
31. C
32. D
33. C
34. A
35. A
36. B

APPENDIX C

List of Graduate Programs-FAHSS

The List of Graduate Programs for Faculty of Arts, Humanities, and Social Sciences

(FAHSS) Programs of Study, University of Windsor (Faculty of Graduate Studies, 2017)

1. Communication, Media & Film (MA)

2. English Language & Literature (MA)

3. History (MA)

4. Philosophy (MA)

5. Political Science (MA)

6. Psychology (MA & Ph.D.)

7. Creative Arts (MA)

8. Sociology and Anthropology (MA & Ph.D.)

9. Social Work (MSW)

APPENDIX D

Focus Group Guide for the Graduate Students

The focus group will have two sections: information seeking preferences and knowledge of the library's electronic resources. These questions may be adapted based on the quantitative findings.

Section 1: Information Seeking Preferences (LibQUAL+® 2013 Survey Questions)

- Can you tell me your preferred method of accessing resources for your research? Why?

- What are the advantages/disadvantages to physically visiting the library to use the resources for your research?

- What are the advantages/disadvantages to accessing the library resources through the library web page?

- How do you think Google Scholar, or non-library gateways can impact your research?

Section 2: Knowledge of the Library's Electronic Resource

- What experience do you have using the library's electronic resources to access e-books, e-journals, or databases?

- When you have run into problems accessing an online resource what have you done to rectify the problem? (Follow up: Do you know about the library's troubleshooting system?)

- Do you know the difference between the results offered by Google Scholar and Primo? (Prompt: do you understand the difference between the Library's subscripted materials and free issues)

APPENDIX E

Permission Letter(s) for Allowing Researcher to Take Place on Site

November 1, 2016

Dear FAHSS Instructor,

My name is Shuzhen Zhao, Education Ph.D. Candidate. I am in the process of completing my Ph.D. dissertation and I wish to measure the information literacy skill level of FAHSS graduate students at the University of Windsor.

My main objective is to better understand which information literacy resources, programs, and materials are preferred by FAHSS graduate students.
This research will help us to understand the students' preferences and tailor new tools with this new information in mind.

The study will evaluate the Information Literacy skills of FAHSS graduate students by collecting both qualitative and quantitative data. The study will be broken down into two stepts. Step one will involve recruiting FAHSS Graduate Students to participate in an online survey. Once the online survey portion of the study has been completed, participants will be contacted a second time to participate in step two of the study: the focus group.

My participant group will include graduate students in the Faculty of Humanities, Arts, and Social Sciences so that participants will have a similar information literacy skill level. FAHSS encompasses a large number of departments. Due to the size and variety of subject areas within this faculty, I will be able to analyze and compare the skill sets of students between departments. This will allow us to tailor new information literacy resources for specific subject areas, and for the faculty as a whole.

This research has been cleared by University of Windsor's Research Ethics Board. The survey, which will be on Fluid Surveys, will be sent out via University of Windsor email in mid-January and take approximately 30 minutes to complete.

I hope you will allow me to make brief presentation at the beginning of your class so that I can introduce myself to the students. These visits are critical as they allow the students to understand my research and why this research is important to them, as well as, another students/staff/faculty, and the library. Students will feel more comfortable asking questions if they are able to talk to the researcher directly.

I appreciate your time and consideration. If you have any questions, please feel free to contact me:

Shuzhen Zhao zhaoszf@uwindsor.ca 519-253-3000 ext. 3162

Thanks so much,

Shuzhen Zhao

Recruitment Materials: Recruitment Poster

Faculty of Humanities, Arts, and Social Sciences Graduate Students!

Participate in an Information Literacy Survey!

The survey takes approximately 30 minutes and will be emailed to your University of Windsor email address.

Please help Shuzhen Zhao, Ph.D. Candidate in Education, to understand specific subject area information literacy needs when using Library services, resources, and programs. The information from the survey will help to provide better information literacy services, programs, and resources to help you complete your research more efficiently!

For more information, please contact Shuzhen Zhao at zhaoszf@uwindsor.ca.
*This Research has been cleared with the University of Windsor Research Ethics Board

University of Windsor

Recruitment Materials: Letters

Subject: A STUDY OF GRADUATE STUDENTS' INFORMATION LITERACY NEEDS IN AN ELECTRONIC RESOURCE ENVIRONMENT

Dear Graduate student,

Insuring that our library services best meet your needs is extremely important. Shuzhen's study is timely, given the multiple changes that we are experiencing in working with "the literature" in our fields. I encourage you to help inform the delivery of services in our libraries by completing the study questionnaire.

Best of luck with your graduate studies,

Eleanor Maticka-Tyndale, PhD, Associate Dean Research and Graduate Studies, FAHSS

Message: Dear FAHSS Graduate Student,

You are invited to participate in Shuzhen Zhao's STUDY OF GRADUATE STUDENTS' INFORMATION LITERACY NEEDS IN AN ELECTRONIC RESOURCE ENVIRONMENT

This study consists of an online survey component and a focus group component. This research will contribute to her dissertation. The online survey will ask you questions about information literacy, focusing on copyright, fair dealing, reputable sources and their usability, and distinguishing between types of sources both technological and in print.

All of your responses and information gathered for the online survey will remain anonymous. The goal of this study is to understand which information literacy services provided by the Leddy Library are most effective, and of these, which students find to be helpful and necessary.
To better understand graduate students' needs and preferences, as a participant you will be asked to distinguish between the qualities of several resources, identify specific search techniques, and outline appropriate rules in regards to information sharing and copyright laws. **If you choose to complete the survey, you will have the option to enter your University of Windsor email into a draw to win one of six $50 gift cards from the University of Windsor Bookstore.**

I will publish my results with the library community, so that others may use my findings and benefit from my research.

Please click HERE to access the Letter of Information and print a copy of the letter for your records.
To fill out the Survey please click HERE.

This research has been cleared by the University of Windsor's Research Ethics Board. The Office of the Research Ethics Board is located at 2146 Chrysler Hall North. They can be contacted by telephone at 519-253-3000 ext. 3948 or by email at ethics@uwindsor.ca.

Should you have any questions about this research project, please email Shuzhen Zhao at zhaoszf@uwindsor.ca.
Thank you so much for your time,

Shuzhen Zhao
Librarian, Head of Acquisition
& Bibliographic Services
Leddy Library,
University of Windsor

Consent to Participate for Focus Group

**CONSENT TO PARTICIPATE IN A STUDY OF GRADUATE STUDENTS'
INFORMATION LITERACY NEEDS IN AN ELECTRONIC RESOURCE
ENVIRONMENT RESEARCH (Focus Group)**

PURPOSE OF THE STUDY
The goal of this study is to measure the information literacy skills of Faculty of Arts, Humanities and Social Sciences (FAHSS) Graduate Students at the University of Windsor. By collecting this data, the researcher hopes to improve information literacy by tailoring programs and resources to the needs of the students.

PROCEDURES
If you volunteer to participate in the focus group, you will be asked to:

1. Review the consent procedures outlined in this document.
2. Participate in a 45-60 minute videotaped focus group. The focus group will involve participating in group discussion and responding to questions relating to information literacy.

All focus groups will be video recorded and each will last approximately one hour. Refreshments will be provided.

POTENTIAL RISKS AND DISCOMFORTS
There are no anticipated risks associated with this study. If you feel uncomfortable contributing to group discussion, or no longer wish to participate you are able to refrain from commenting or remove yourself from the focus group. You are welcome to contact your subject librarian to learn more about online resources and how to navigate the databases and platforms: http://leddy.uwindsor.ca/contact-us. Once the study is complete the researcher will provide a sheet with a list of links to resources in order to alleviate anxiety for the participants.

POTENTIAL BENEFITS TO PARTICIPANTS AND/OR TO SOCIETY
The information provided from the focus group will influence the creation and implementation of research tools, courses and resources to improve the information literacy of FAHSS graduate students. The resources and courses created to assist graduate students can be modified and used to help other professionals and scholarly communities.

COMPENSATION FOR PARTICIPATION
Participants have the option to be entered into a draw to win 1 of 6 $50 gift cards from the University of Windsor Bookstore.

CONFIDENTIALITY

Any information that is obtained in connection with this study will remain confidential. No information will be given to third parties. Your contact information will only be used to contact you for the focus group portion of the study and if you win the draw.

To protect you, all focus group responses will be de-identified immediately. After analysis is complete, the transcripts from the focus groups will be stored on a secure server for 7 years for the purpose of further research, and then deleted.

The researcher cannot guarantee complete confidentiality for the focus group portion of the study, despite precautions the researcher might take as the focus group is a group event. This means that while the information will be treated as confidential by the researcher, responses will be heard by all the participants, and therefore confidentiality cannot be guaranteed.

PARTICIPATION AND WITHDRAWAL

If you choose to participate, you must agree to be videotaped. If you choose to withdraw from the focus group, you may do so; however, videotaping will not be stopped and any information contributed prior to your withdrawal will still be collected. Participating, withdrawing, or choosing not to take part in the study will have no consequences on your academic standing.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE PARTICIPANTS

The researcher will summarize the research findings on the University of Windsor's Research Ethics Board Study Results webpage: http://www.uwindsor.ca/reb/study-results. The researcher hopes to create new information literacy programs and tools based on this research, and publish the findings from this study for the library community. If you wish to access the publication, please contact Shuzhen Zhao at zhaoszf@uwindsor.ca or 519-253-3000 ext. 3162.

SUBSEQUENT USE OF DATA

These data may be used in subsequent studies, in publications and in presentations.

RIGHTS OF RESEARCH PARTICIPANTS

If you have questions regarding your rights as a research participant, contact: Research Ethics Coordinator, University of Windsor, Windsor, Ontario, N9B 3P4; Telephone: 519-253-3000, ext. 3948; e-mail: ethics@uwindsor.ca

SIGNATURE OF RESEARCH PARTICIPANT/LEGAL REPRESENTATIVE

I understand the information provided for the Study of Graduate Students' Information Literacy Needs in an Electronic Resource Environment as described herein.

My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

☐   I do consent to being videotaped.

_____
Name of Participant

_____   _____
Signature of Participant   Date

SIGNATURE OF INVESTIGATOR
These are the terms under which I will conduct research.

_____   _____November 1, 2016____

    Signature of Investigator   Date

APPENDIX I

Information Letter to Participate (Focus Group)

INFORMATION LETTER TO PARTICIPATE IN A STUDY OF GRADUATE STUDENTS' INFORMATION LITERACY NEEDS IN AN ELECTRONIC RESOURCE ENVIRONMENT (Focus Group)

PURPOSE OF THE STUDY
The goal of this study is to measure the information literacy skills of Faculty of Arts, Humanities and Social Sciences (FAHSS) Graduate Students at the University of Windsor. By collecting this data, the researcher hopes to improve information literacy by tailoring programs and resources to the needs of the students.

PROCEDURES
If you volunteer to participate in the focus group, you will be asked to:

1. Review the consent procedures outlined in this document.
2. Participate in a 45-60 minute videotaped focus group. The focus group will involve participating in group discussion and responding to questions relating to information literacy.

All focus groups will be video recorded and each will last approximately one hour. Refreshments will be provided.

POTENTIAL RISKS AND DISCOMFORTS
There are no anticipated risks associated with this study. If you feel uncomfortable contributing to group discussion, or no longer wish to participate you are able to refrain from commenting or remove yourself from the focus group. You are welcome to contact your subject librarian to learn more about online resources and how to navigate the databases and platforms: http://leddy.uwindsor.ca/contact-us. Once the study is complete the researcher will provide a sheet with a list of links to resources in order to alleviate anxiety for the participants.

POTENTIAL BENEFITS TO PARTICIPANTS AND/OR TO SOCIETY
The information provided from the focus group will influence the creation and implementation of research tools, courses and resources to improve the information literacy of FAHSS graduate students. The resources and courses created to assist graduate students can be modified and used to help other professionals and scholarly communities.

COMPENSATION FOR PARTICIPATION
Participants have the option to be entered into a draw to win 1 of 6 $50 gift cards from the University of Windsor Bookstore.

CONFIDENTIALITY

Any information that is obtained in connection with this study will remain confidential. No information will be given to third parties. Your contact information will only be used to contact you for the focus group portion of the study and if you win the draw.

To protect you, all focus group responses will be de-identified immediately. After analysis is complete, the transcripts from the focus groups will be stored on a secure server for 7 years for the purpose of further research, and then deleted.

The researcher cannot guarantee complete confidentiality for the focus group portion of the study, despite precautions the researcher might take as the focus group is a group event. This means that while the information will be treated as confidential by the researcher, responses will be heard by all the participants, and therefore confidentiality cannot be guaranteed.

PARTICIPATION AND WITHDRAWAL

If you choose to participate, you must agree to be videotaped. If you choose to withdraw from the focus group, you may do so; however, videotaping will not be stopped and any information contributed prior to your withdrawal will still be collected. Participating, withdrawing, or choosing not to take part in the study will have no consequences on your academic standing.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE PARTICIPANTS

The researcher will summarize the research findings on the University of Windsor's Research Ethics Board Study Results webpage: http://www.uwindsor.ca/reb/study-results. The researcher hopes to create new information literacy programs and tools based on this research, and publish the findings from this study for the library community. If you wish to access the publication, please contact Shuzhen Zhao at zhaoszf@uwindsor.ca or 519-253-3000 ext. 3162.

SUBSEQUENT USE OF DATA

These data may be used in subsequent studies, in publications and in presentations.

RIGHTS OF RESEARCH PARTICIPANTS

If you have questions regarding your rights as a research participant, contact: Research Ethics Coordinator, University of Windsor, Windsor, Ontario, N9B 3P4; Telephone: 519-253-3000, ext. 3948; e-mail: ethics@uwindsor.ca

SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.

_____ _____November 1, 2016____
Signature of Investigator   Date

Letter of Consent to Participate for Survey

LETTER OF CONSENT TO PARTICIPATE IN A STUDY OF GRADUATE STUDENTS' INFORMATION LITERACY NEEDS IN AN ELECTRONIC RESOURCE ENVIRONMENT (Survey)

PURPOSE OF THE STUDY
The goal of this study is to measure the information literacy skills of Faculty of Arts, Humanities and Social Sciences (FAHSS) Graduate Students at the University of Windsor. By collecting this data, the researcher hopes to improve information literacy by tailoring programs and resources to the needs of the students.

PROCEDURES
If you volunteer to participate in the survey, you will be asked to:
1. Complete an online survey composed of 35 questions, it will take approximately 30 minutes.

POTENTIAL RISKS AND DISCOMFORTS
There are no anticipated risks associated with this study, however; if you are unaware of the online resources available, anxiety could set in. You are welcome to contact your subject librarian to learn more about online resources and how to navigate the databases and platforms: http://leddy.uwindsor.ca/contact-us. Once the study is complete the researcher will provide a sheet with a list of links to resources in order to alleviate anxiety for the participants.

POTENTIAL BENEFITS TO PARTICIPANTS AND/OR TO SOCIETY
Results from this survey will be used to help the researcher better understand the information literacy needs of FAHSS graduate students. The resources and courses created to assist graduate students can be modified and used to help other professionals and scholarly communities.

COMPENSATION FOR PARTICIPATION
Participants have the option to be entered into a draw to win 1 of 6 $50 gift cards from the University of Windsor Bookstore.

CONFIDENTIALITY
Any information that is obtained in connection with this study will remain confidential. No information will be given to third parties. Your contact information, the Uwindsor email address, which you are able to provide on the final landing page for the draw will only be used to contact you for the focus group portion of the study and/or if you win the draw.

To protect you, all survey responses will be de-identified immediately. After analysis is complete, the surveys will be stored on a secure server for 7 years for the purpose of further research, and then deleted.

The researcher can guarantee complete confidentiality for the online survey portion of the study.

PARTICIPATION AND WITHDRAWAL
You may withdraw from the survey at any time by simply closing the browser window, when you withdraw, your information will also be deleted and your email will not be entered into the draw for the gift certificate. However, once you have submitted the survey, the researcher is no longer able to remove your data as the information will immediately be de-identified and coded.

Participating, withdrawing, or choosing not to take part in the study have no consequences on your academic standing.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE PARTICIPANTS
The researcher will summarize the research findings on the University of Windsor's Research Ethics Board Study Results webpage: http://www.uwindsor.ca/reb/study-results. The researcher hopes to create new information literacy programs and tools based on this research, and publish the findings from this study for the library community. If you wish to access the publication, please contact Shuzhen Zhao at zhaoszf@uwindsor.ca or 519-253-3000 ext. 3162.

SUBSEQUENT USE OF DATA
These data may be used in subsequent studies, in publications and in presentations.

RIGHTS OF RESEARCH PARTICIPANTS
If you have questions regarding your rights as a research participant, contact: Research Ethics Coordinator, University of Windsor, Windsor, Ontario, N9B 3P4; Telephone: 519-253-3000, ext. 3948; e-mail: ethics@uwindsor.ca

CONSENT FOR PARTICIPATION
I understand the information provided for the Information Literacy Skills Study online survey as described herein. My questions have been answered to my satisfaction, and I agree to participate in this survey. I have been given a copy of this form.
By clicking "I accept" on the first page of the online survey I have consented to participate in the survey and for the researcher to use my data for the purpose of research.

SIGNATURE OF INVESTIGATOR
These are the terms under which I will conduct research.

_____ _____November 1, 2016_____
Signature of Investigator   Date

APPENDIX K

Letter of Information for Consent for Survey

LETTER OF INFORMATION FOR CONSENT TO PARTICIPATE IN A STUDY OF GRADUATE STUDENTS' INFORMATION LITERACY NEEDS IN AN ELECTRONIC RESOURCE ENVIRONMENT (Survey)

PURPOSE OF THE STUDY
The goal of this study is to measure the information literacy skills of Faculty of Arts, Humanities and Social Sciences (FAHSS) Graduate Students at the University of Windsor. By collecting this data, the researcher hopes to improve information literacy by tailoring programs and resources to the needs of the students.

PROCEDURES
If you volunteer to participate in the survey, you will be asked to:
1. Complete an online survey composed of 35 questions, it will take approximately 30 minutes.

POTENTIAL RISKS AND DISCOMFORTS
There are no anticipated risks associated with this study, however; if you are unaware of the online resources available, anxiety could set in. You are welcome to contact your subject librarian to learn more about online resources and how to navigate the databases and platforms: http://leddy.uwindsor.ca/contact-us. Once the study is complete the researcher will provide a sheet with a list of links to resources in order to alleviate anxiety for the participants.

POTENTIAL BENEFITS TO PARTICIPANTS AND/OR TO SOCIETY
Results from this survey will be used to help the researcher better understand the information literacy needs of FAHSS graduate students. The resources and courses created to assist graduate students can be modified and used to help other professionals and scholarly communities.

COMPENSATION FOR PARTICIPATION
Participants have the option to be entered into a draw to win 1 of 6 $50 gift cards from the University of Windsor Bookstore.

CONFIDENTIALITY
Any information that is obtained in connection with this study will remain confidential. No information will be given to third parties. Your contact information, the Uwindsor email address, which you are able to provide on the final landing page for the draw will only be used to contact you for the focus group portion of the study and/or if you win the draw.

To protect you, all survey responses will be de-identified immediately. After analysis is complete, the surveys will be stored on a secure server for 7 years for the purpose of further research, and then deleted.

The researcher can guarantee complete confidentiality for the online survey portion of the study.

PARTICIPATION AND WITHDRAWAL
You may withdraw from the survey at any time by simply closing the browser window, when you withdraw, your information will also be deleted and your email will not be entered into the draw for the gift certificate. However, once you have submitted the survey, the researcher is no longer able to remove your data as the information will immediately be de-identified and coded.

If you decide to enter your email address into the draw for a $50 bookstore gift card, the address will be used by the researcher to contact you to participate in the second part of the study, the focus group.

Participating, withdrawing, or choosing not to take part in the study have no consequences on your academic standing.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE PARTICIPANTS
The researcher will summarize the research findings on the University of Windsor's Research Ethics Board Study Results webpage: http://www.uwindsor.ca/reb/study-results. The researcher hopes to create new information literacy programs and tools based on this research, and publish the findings from this study for the library community. If you wish to access the publication, please contact Shuzhen Zhao at zhaoszf@uwindsor.ca or 519-253-3000 ext. 3162.

SUBSEQUENT USE OF DATA
These data may be used in subsequent studies, in publications and in presentations.

RIGHTS OF RESEARCH PARTICIPANTS
If you have questions regarding your rights as a research participant, contact: Research Ethics Coordinator, University of Windsor, Windsor, Ontario, N9B 3P4; Telephone: 519-253-3000, ext. 3948; e-mail: ethics@uwindsor.ca

CONSENT FOR PARTICIPATION
Submission of your survey inputs implies that your consent for the researcher to use your data for the purpose of research.

SIGNATURE OF INVESTIGATOR
These are the terms under which I will conduct research.

_____   November 1, 2016
Signature of Investigator   Date

VITA AUCTORIS

NAME: Shuzhen Zhao

PLACE OF BIRTH: Beijing, China

EDUCATION: Bachelor of Library Science
Peking University, Beijing, China
June 1991

Master of Library and Information Science
Peking University, Beijing, China
June 1995

Master of Library and Information Science
University of Western Ontario, London, Canada
June 2003

Master of Education
Brandon University, Brandon, Canada
June 2007

Joint Ph.D. in Educational Studies: Brock
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Home University: University of Windsor
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May 2019