Faculty of Information & Media Studies

LIS 698 - Guided Research Project
Final Report

Information-Seeking Behaviour of Graduate Students

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Background

Information literacy (IL) is an integral component of the quest for knowledge. It includes developing a critical disposition and practical use of information technology and resources, whether in a print or electronic format. The American Library Association defines a student as information literate if s/he is able to access information effectively and efficiently, to evaluate information critically and comprehensively, and to use information accurately and creatively (ALA, 1998). For graduate students in particular, who are novice researchers embarking on their careers, gaining these information competencies is a critical component of becoming knowledgeable, competitive and current. In research-intensive programs in which new findings expand the boundaries of scholarship, the student's knowledge must always be up-to-date. For these reasons, many academic library professionals have called for curriculum integration of information literacy skills training to assist students to develop these skills early in their graduate school career (Lampert, 2005).

It is important that the information literacy needs of full-time, research-intensive graduate students be investigated in a systematic manner. The knowledge required by such graduate students to expertly access, evaluate and utilize information resources that are essential for success in their graduate programs is currently unknown. In previous research, conclusions appear to be limited due to issues regarding heterogeneity of graduate student enrolment status and the manner in which data collected from a myriad of departments and faculties have been combined for analyses (e.g., Liew et al., 2000; and Liu, 2005). Finally, there is a lack of cross-sectional research with this population that could provide valuable data regarding the development of expertise.

Information Literacy and Graduate Students

Why are information literacy skills important for graduate students in research programs? The primary career goal of graduate students in research-intensive departments is to become faculty researchers. Thus, it is important to educate these students so that they can optimally access the information that they require for success. According to Gass (2001) and Hiller (2002), students in research intensive programs are also required to use scientific and scholarly communication in scientific journals. These needs are significantly different from the skills and resources utilized in non-research based programs. Information literacy enhances the research abilities of graduate students at their current institution, as well as providing the groundwork for using libraries and information sources they will encounter in the future (Lampert, 2005). Additionally, Sabella and Tyler (2001) have argued that those who do not stay current in terms of their information literacy skills will not be cutting-edge researchers in their field. Finally, Washington-Hoagland and Cloughtery (2002) claim that information literacy training of faculty is critical for their success. Although these researchers do not theorize specifically about graduate students, this claim would presumably apply to them as well because many graduate students are essentially future faculty.

Further research concerning information literacy is required to address the current state of graduate students' knowledge of technology, available resources, and skills. As noted by Liu (2005) and Lampert (2005), there is a plethora of research addressing information literacy in undergraduate students, but it is lacking for graduate students. For example, in the area of

undergraduate students in Psychology, there are studies outlining guidelines for literacy skills (Merriam et al., 1992), benefits of instruction (Baxter, 1986; Daugherty & Carter, 1997; Thaxton 2002), and integration of information literacy training into undergraduate courses (Thaxton, 2004).

Thaxton (2002) suggests that information literacy training is important because faculty supervisors may misjudge the ability of their graduate students to retrieve and evaluate information. Problems may arise even if a graduate student received information literacy training during their undergraduate career because the student may be entering a novel area of study. Also, graduate students use materials that are more specialized than undergraduates, and for somewhat different purposes (i.e., conducting and writing theses and articles versus writing essays or exams). Hence, even if students began information literacy training as undergraduates, the application of these skills needs to be extended at the graduate level. Currently, an ever increasing graduate student enrollment is the trend[1]. Given this trend, it becomes even more important to establish exceptional information literacy skills so graduate students become competitive to secure future employment and research grants. Hence, from a national perspective, information literacy is critical to the success of Canadian research in general.

Identifiable Gaps in the Literature

The information literacy practices of full-time, research-intensive graduate students need to be investigated in a systematic manner. Previous studies are inconclusive regarding how graduate students access, evaluate and utilize information resources that are essential for success in their programs. Variations in demographics, such as heterogeneity of enrolment status and variations in data collection at the department or faculty level contribute to the difficulty of comparing results or developing meta-analyses. Finally, there is a lack of cross-sectional studies within this population, which could provide valuable data regarding the development of expertise.

Enrolment Status and Sample Homogeneity

The existence of heterogeneous populations within the sample may create difficulty in interpreting the data. Published studies include respondents grouped across disciplines with a combination of professional, full-time, part-time and distance graduate students. In addition to sampling (and often collapsing) across disciplines, the types of surveyed respondents (undergraduate students, graduate students, faculty) also vary. For example, Friedlander (2002) found that faculty and graduate students expect a mix of print and electronic resources, whereas undergraduates strongly prefer electronic resources. Liew et al. (2000) surveyed 83 graduate students from a variety of disciplines and discovered that 73% prefer electronic versus print journals. Similarly, Liu (2005) explored graduate students' use of print and electronic sources and concluded that they want a choice of source because each source has a different role.

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[1]Locally, there is a push to double the number of graduate students enrolled in Ontario universities.
The Council of Ontario Universities (COU)'s task force on graduate education is asking the Ontario government to fully fund graduate education and establish a 10-year goal to double graduate enrolment.
From: http://www.cou.on.ca/content/objects/Advanced%20degrees%2021.pdf.

It appears that published research has not examined full-time, research-intensive graduate student populations. Yet it is important to focus specifically on these students as a homogenous sample because their needs and skills differ substantially from part-time or distance students. Observations of their information-seeking behaviour would establish how this population acquires and applies information literacy skills.

Studies of graduate students and information literacy, when analyzed by department or faculty, result in small sample sizes. Chrzastowski and Joseph's (2006) web-based survey of 1400 graduate and professional students investigated their use of library services, facilities and collection studies. Although the study captured multiple disciplines, the number of respondents per discipline was too small for reliable data analysis. In addition, the authors did not stipulate whether the respondents were full-time, part-time or distance students, a distinction that can result in quite different goals and behaviors. Chrzastowski and Joseph concluded that there are differences among disciplines in terms of how they use the library and what type of materials are needed, but that this differential is shrinking. A similar situation is seen in Perrett's (2004) survey at the Australian National University in which 107 graduate students rated their ability to find information, and then were tested on their ability to search for it. Once again, comparisons among the groups, comprising areas of study, were of questionable validity due to the small sample sizes (2-45 participants in each group). In summary, a central problem is that these studies have not investigated research-intensive, full-time populations as a homogenous sample.

Cross-sectional Investigation

At present, there are no cross-sectional studies investigating the developmental trajectory of graduate students' information literacy in the absence of formal training. While it is true that graduate students are trained in many ways by their supervisors, typically, students train themselves in terms of information access and use, and often their supervisors are far from experts in this domain (Williams, 2000). As a result, either no information or, perhaps worse, misinformation, may be transmitted to students (Parrish, 1989). In a qualitative, longitudinal study of academics and new researchers, Barry (1997) found that faculty assumed librarians were assisting their graduate students in learning to use the library, while librarians assumed that faculty members were responsible for this role. Washington-Hoagland and Clougherty (2002) surveyed 318 professional and graduate students from varying disciplines at the University of Iowa and concluded that graduate students do not in fact rely on faculty for library information. They also reported that just under half of the respondents indicated that they needed library instructional classes, although they had not taken advantage of them. This suggests that either the respondents were either not aware of the full range of library services available for their use or that they felt it was not important enough to pursue on their own. Indeed, Perrett (2004) found that over half of surveyed graduate students overestimated their own skills, supporting Williams' view that it cannot be assumed that graduate students understand how to conduct library research. In Washington-Hoagland and Clougherty (2002), over 30% of the respondents were part-time students. However, this investigation did not compare the disciplines or analyze the number of years into the program for a cross-sectional view.

Psychology Graduate Students

Many graduate programs in Psychology Departments in North America are research intensive and the majority require Masters theses and doctoral dissertations for degree completion. In addition, most Psychology Department Graduate Programs expect students to publish additional research that is not included as thesis research. Without additional publications, graduate students will not obtain employment as a faculty member in a research-intensive department. Hence, for successful theses and other research, there is a need for graduate students to be comprehensive and up-to-date in searching the current state of the literature (Barry, 1997).

The Research Setting

Library and information science professionals understand the importance of strong information literacy skills in the research environment, but the institutions that employ these professionals in their libraries may not. For example, to date, UWO does not have a formal information literacy program for entering graduate students in the social sciences, which includes the Department of Psychology (Waugh, 2006). Recently, however, a needs assessment was conducted for graduate students in the Faculties of Engineering, Health Science, Medicine and Dentistry, and Science at UWO (Antwi-Nsiah et al., 2006). Results from faculty focus groups, student focus groups and student surveys indicated that there is a need for information literacy for graduate students in these Faculties. Recommendations made from these findings resulted in the development of workshops for these student groups. It would be beneficial if current research was also available to determine the importance of information literacy for other research-intensive graduate students. Anecdotal evidence suggests that Social Science graduate students at UWO prefer one-on-one assistance for information literacy instruction (Waugh). However, a more structured investigation with reliable conclusions is necessary before changes in the delivery of information literacy for any graduate student group may be recommended.

Based on the present state of the literature, the knowledge required by psychology graduate students to seek and correctly utilize the information resources that are essential for success in their graduate programs is unknown. Therefore, it is important to investigate how these full-time, research-intensive graduate students acquire information literacy skills. This is the primary goal of the present research.

Methodology

This study was designed as a pilot project to explore the information-seeking behaviour and information literacy skills (IL) of full-time, research-intensive graduate students. A 5-page paper survey containing 14 quantitative items was designed to investigate how graduate students have learned to access information for coursework and/or research, what they access, and how they access it (Appendix 1). The majority of questions were closed-ended with ordered choices. One qualitative question was posed, to gain suggestions for library services to assist graduate students when looking for information for their coursework or research. Demographic information was also collected. In compliance with the SSHRC Guidelines, a non-medical research ethics protocol was completed and approved by the Faculty of Information and Media Studies Research Committee at the University of Western Ontario.

Participants

The target sample consisted of graduate students enrolled in the Department of Psychology at the University of Western Ontario (UWO). Currently, the Department of Psychology houses one of the largest graduate student populations at UWO, consisting of approximately 110 students (McRae, personal communication, December 2006). Because the total number of graduate students represents a manageable population, all were invited to participate (Fidzani, 1998).

Two weeks after the initial group email request for participation, a second and final appeal was e-mailed to the same 110 students. Upon agreeing to participate, the paper survey was delivered to the graduate students' mailboxes. The respondents were asked to return the completed survey in an enclosed, addressed envelope through the campus mail system.

Results and Discussion

The survey data were compiled, coded and entered into a database. Frequency data were generated using SPSS for all of the questionnaire items. These frequencies are presented in Appendix 2. Participants were grouped by year of study (M.Sc., Ph.D. 1 and 2, Ph.D. 3 and greater), and chi-square analyses were used to investigate differences that may develop over the span of their graduate career (Appendix 3). Chi-square tests were used to identify significant relationships using a critical alpha value of .05. Finally, the qualitative data were organized into thematic categories as detailed in Appendix 4.

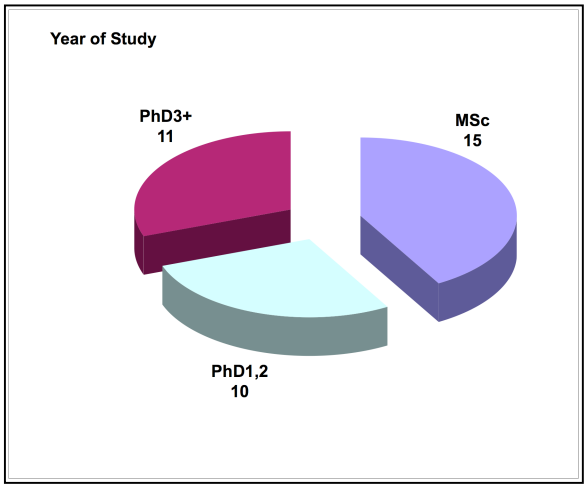
These results are discussed according to research themes. The 14 survey items were connected by the following themes:

> ***Theme I: Attitude*** - attitude toward the importance of information literacy (Q1, Q13) and perceived attitude of supervisors, other faculty, reviewers and editors (Q2, Q3);
>
> ***Theme II: Library use behaviour*** - level of comfort when using the library (Q4, Q5), types of resources (Q8, Q10, Q14), and services accessed (Q7);
>
> ***Theme III: Provision of instruction*** - perceived need for information literacy instruction (Q13), recognized, formal IL training (Q6, Q9), and other IL skills and where these were learned (Q11, Q12).

The qualitative data (Question 15) were coded for two emergent themes : access (Theme II) and instruction (Theme III).

A total of 36 graduate students completed and returned the survey: 13 males and 23 females. Figure 1 depicts their distribution within the respondents' year of study. Complete demographic information is provided in Appendix 2 (Descriptive Statistics).

Figure 1 - Year of Study



Theme I: Attitude toward information literacy

Questions 1, 2, 3 and 13 were designed to capture graduate students' attitudes toward the importance of information literacy. All respondents agree that it is important to their instructors, supervisors, reviewers and editors that they correctly cite all relevant articles when writing course papers, theses, or research manuscripts. However, just over 80% of these same students feel that it is important to exhaustively search the literature before they begin a research project. Disturbingly, 11% disagree and 8% remain neutral (Figure 2). Thus, even though all of the students know it is important to their supervisors and other decision-makers in their field (that is, those who decide whether their manuscripts are worth publishing) to access, evaluate and use information accurately for their research, they are not doing it. Similarly, when asked about their attitudes about IL instruction (Question 13), only 50% agree that they need formal instruction for more effective and efficient use of the library. 40% remain neutral (do not care one way or the other) and 9% disagree (Figure 3). Clearly, as Lampert (2005) suggests, graduate students do not fully understand the importance of information literacy. Additionally, these results follow Perret's (2004) finding that graduate students overestimate their own skills when using the library and believe that they do not need additional instruction.

Figure 2 - Importance of exhaustive searching (Question 1)

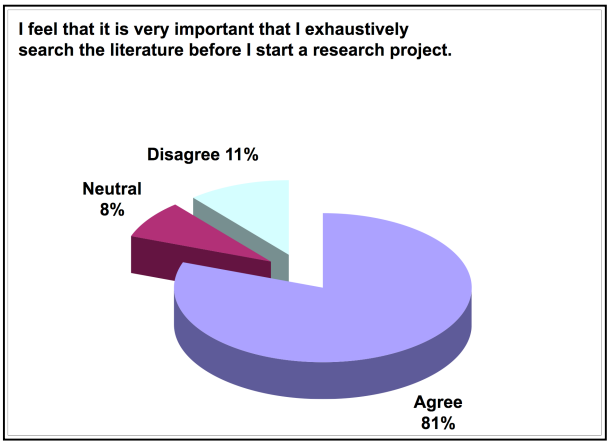
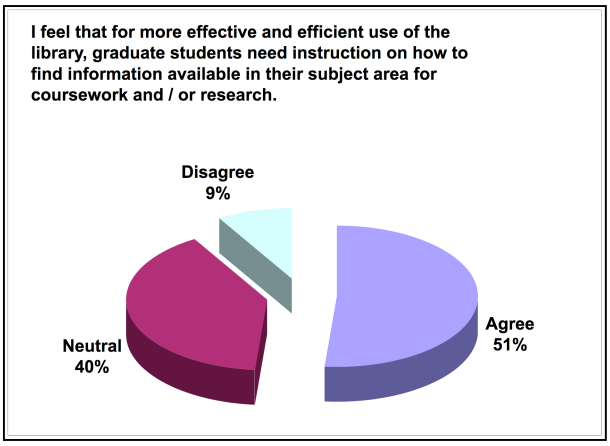


Figure 3 - Attitude toward IL instruction (Question 13)

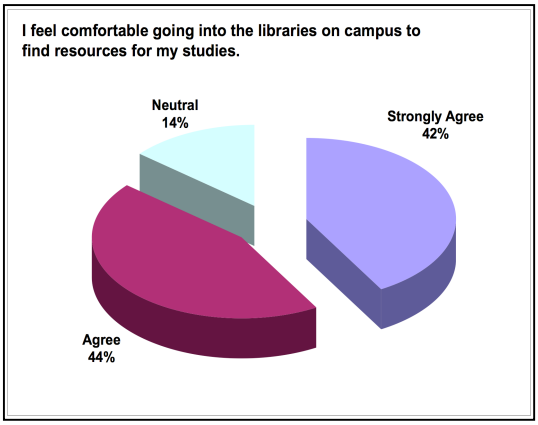


Theme II: Library use

Questions 4, 5, 7, 8, 10, and 14 involve graduate students' library use behaviour by exploring the respondents' library anxiety, the types of resources they use, how they access them, and where they seek assistance when using them. All of the respondents use The D.B. Weldon (DBW) in some capacity. The other campus libraries (for example, Taylor, Education, Business, King's and Huron) are used to a lesser degree (Question 5, Appendix 2). It was surprising that a smaller library like Huron was very often used by 14% of the respondents because it has significantly fewer resources than DBW or Taylor. It is possible that these students may be using Huron because they did so during their undergraduate studies, or that they find its location provides convenient access to resources, including web-based material.

All students surveyed are comfortable going into the libraries on campus to find resources (Question 4, Figure 4). While the literature has shown a tendency for graduate students to be uncomfortable using university libraries (Jiao & Onwuegbuzie, 2001; Jiao & Onwuegbuzie 1998; Onwuegbuzie & Jiao, 1998), library anxiety is not prevalent in this group of students. Although this group is comfortable visiting the library, the issue of library anxiety may be revealed in the questions about requesting assistance when using library resources (Question 7). These results reveal that this group of graduate students seldom or never seek formal assistance when learning how to use information available through the library (Question 7, Appendix 2).

Figure 4 - Comfort level in libraries (Question 4)



Questions 8 and 10 address the use of sources for coursework and / or research. Although all of the respondents physically visit the library to find resources (Question 10.1), only 25% do so regularly. The majority of the information is sought electronically. For example, all of the students access library resources through the library web page (Question 10.2), and most often search for information through the online library catalogue (92%), and online databases (100%). The two databases most frequently used by this group of graduate students (Question 14) were PsycINFO (89% for coursework, 86% for research) and PubMed (25% for coursework, 36% for research). Clearly, this homogenous group of graduate students do not want a choice of print and electronic sources as suggested by Liu (2005), but prefer to primarily use electronic resources.

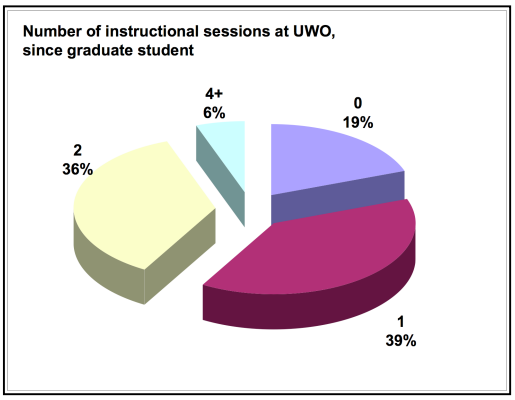
The qualitative data also support the importance of electronic access for these graduate students. For example, suggestions to improve library services and resources include increasing the number of articles, journals and back issues that are available online. These results support the group's affinity toward electronic material.

Theme III: Provision of instruction

Questions 6, 9, 11, 12 and 13 investigate the types of IL instruction the respondents have received. For the purposes of this pilot project, formal IL instruction is provided by librarians, whereas informal instruction is provided by non-librarians (e.g., self-taught, peers, supervisors, instructors).

Question 6 directly addresses the number of formal information literacy sessions in which graduate student have participated. More than 80% of these graduate students report that they have had at least one instructional session at UWO (Figure 5).

Figure 5 - Number of Instructional Sessions (Question 6)



Question 9 addresses instruction that is requested when a student needs assistance finding relevant information. Contrary to the survey results reported by Washington-Hoagland and Clougherty (2002), our findings show that the respondents do indeed rely on faculty for information. Specifically, these psychology graduate students first approach their supervisors (94%), then peers (75%), other faculty (36%) or a reference librarian (36%). When addressing information literacy needs, it would appear that librarians are viewed as peripheral members of the students' departmental community (comparable to other faculty and thesis committee members) rather than being allotted the number one position of information professional. Training (Williams, 2000) or mistraining (Parrish, 1989) by supervisors is the core or sole source of information instruction for many graduate students. The present study confirms the respondents' reliance on their supervisors for information literacy training.

Questions 11 and 12 investigate the use of supplementary information management tools that graduate students can employ to support their research and coursework. Specifically, question 11 asks "Do you use software to manage your citations?" A chi-square analysis of MSc and

PhD students revealed that it is the MSc students who are using these tools to manage information (Appendix 3). Contrary to the developmental theory that students would learn these skills as they progress through graduate school (Williams, 2000), it is the MSc students who are currently using these skills. Perhaps the recent acquisition and promotion of IL in the undergraduate education of these students provided them with an opportunity to gain these skills. Further investigation however, reveals that most have taught themselves how to use the software. Perhaps doctoral students just do not know that these tools are available and are unaware that librarians are available to instruct them regarding their use.

Question 12 investigates current awareness services (ETOCs or alerting services) to ensure current knowledge on particular research topics. Surprisingly, only 11% or 4 of the 36 students surveyed use current awareness services. This is problematic. As Sabella and Tyler (2001) state, to be the best in their field, graduate students need currency in their IL skills. However, this group of respondents is clearly not relying on alerting services to conveniently keep them up to date. Nor is it fostering its development of IL skills with respect to retrieval and assessment of resources by using current awareness services. These results are not unexpected, based on the attitude toward IL (Figure 3).

The qualitative data indicate that these students want more instruction. As detailed in Appendix 4, these respondents express an interest in further developing a variety of information literacy skills. Some examples the respondents suggested include learning how to use ETOCs, alerting services, interlibrary loans and reference management software as well as developing better searching skills. There was also a recognition that they need to increase their overall awareness of library resources and services which can assist them with their coursework and research. Specific suggestions also support furthering information literacy instruction such as:

> *"A resource librarian could be invited to orientation, or a yearly seminar to inform students of changes and new programs available (e.g., alerting systems)."*
>
> *"Subject librarian could let more faculty know about their skills, and then faculty could encourage their students to make use of the library services."*

Instituting mandatory attendance for information literacy sessions would ensure that incoming Psychology graduate students are aware of the resources and services available. Ongoing attendance for other departmental graduate students and faculty would also be encouraged so that they remain up-to-date about new resources and research tools available for their use. For the convenience of the students and faculty, these seminars could occur in the Psychology Department's Undergraduate Computing Lab.

Conclusion and Recommendations

This research sought to answer to three questions. The first, *Is formal instruction in information literacy being provided to full-time, research-intensive graduate students?* can be answered affirmatively. Librarians are providing some formal instruction, but further investigation into these sessions is warranted. For example, specifics could be pursued: What was the session about and what was liked or disliked about the session? The second, *Who is providing this instruction?* can be answered in two parts. Formally, librarians are providing some instruction as indicated by the instructional sessions graduate students attended. However, these same students seem to rely on their supervisors and peers for informal instruction before they turn to librarians. Response to the third question, *What is the developmental trajectory of learning and using these skills with and without formal training?* is inconclusive due to the number of participants recruited for this homogenous group of students, similar to previous studies (Chrzastowski & Joseph, 2006; Perret, 2004).

The findings of this research provide an important overview of how psychology graduate students at one research institution find information for coursework and research. Clearly, these results indicate that this group prefers electronic access to resources. Consequently, focusing on IL instruction that targets the effective and efficient use of electronic resources would be appropriate. Although none of the students are uncomfortable using the library, they choose electronic access to sources over and above access within the walls of the library. As one user states, "*I know the resources are there, I just don't use in-person resources often.*" Hence, electronic information literacy instruction should be developed to encourage more students to participate in these sessions. Interestingly, this is contrary to the view that graduate students in the Faculty of Social Science want one-on-one instruction with a librarian by appointment (Waugh, 2006). However, because of the broad range within the Faculty of Social Science, perhaps treating them as a homogenous group is not appropriate.

This research demonstrates that psychology graduate students do not like to ask for assistance when learning how to use resources. None of the students use alerting systems, and less than half use citation management software. Because these students displayed a proclivity for electronic access, perhaps introducing these resources through e-mail notification and following-up in the same manner, would increase the use and success of instructional programs. The qualitative data indicate that many of these students have an interest in furthering their information literacy skills. It would therefore be valuable to actively pursue this group of users. Finally, since supervisors are the number one source of information for this graduate student population, faculty should also be targeted to ensure that they are aware of the information literacy services that are available.

The effectiveness of developing formal information literacy programs in graduate students' settings has not been widely studied. This pilot study provides a basis to implement and assess such programs for research-intensive, full-time graduate students in the Department of Psychology at the University of Western Ontario.

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Appendix 1 - Distributed Survey

Information-Seeking Behaviour of Graduate Students

Introduction

Thank you very much for agreeing to answer approximately 21 questions investigating how you, as a graduate student, find information for coursework and research. ***The survey should take approximately 10 minutes to complete.*** This research has been approved by the University of Western Ontario Research and Ethics Board. All responses are confidential and will not include any identifying information. All full-time graduate students in the Department of Psychology have been invited to participate. Participation is voluntary and your decision to participate or not participate will in no way affect your grades or status at the University of Western Ontario. You may refuse to participate, refuse to answer any questions or withdraw from the survey at any time. There are no known risks or direct benefits to your participation in this study. Participating in this study does not restrict you from participating in other research. Voluntary agreement to participate in this survey is indicated by completing and submitting this questionnaire.

To complete this questionnaire, please follow the instructions following each question or statement. Please keep in mind that these questions relate to your graduate career at the University of Western Ontario. Results from this survey will contribute to our understanding of what library services are required to best assist graduate students when searching for information for coursework and/or research.

If you have any questions about this study, please contact:	If you have questions about your rights as a research participant, please contact:
Marni Harrington, MLIS candidate Jennifer Noon, Lecturer Faculty of Information and Media Studies University of Western Ontario 519-661-2111(x88490) or mharrin5@uwo.ca 519-661-2111(x88490) or jnoon@uwo.ca	Office of Research Ethics Room 00045 Dental Science Building University of Western Ontario 519-661-3036 or ethics@uwo.ca

Thank you very much for completing this survey.
Your contribution is very important to improving library services.

****

Please return your completed questionnaire by **February 5th, 2007**,
in the enclosed, addressed, campus mailing envelope provided.

****

This information page is for you to keep for your records.

1. I feel that it is very important that I exhaustively search the literature before I start a research project. (choose one)
   - ☐ Strongly agree
   - ☐ Agree
   - ☐ Neutral
   - ☐ Disagree
   - ☐ Strongly disagree

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2. I feel that it is very important to my instructors and supervisors that I correctly cite all relevant articles when I write course papers, theses, or research manuscripts. (choose one)
   - ☐ Strongly agree
   - ☐ Agree
   - ☐ Neutral
   - ☐ Disagree
   - ☐ Strongly disagree

---

3. I feel that it is very important to reviewers and editors that I correctly cite all relevant articles in my manuscripts that are submitted for publication. (choose one)
   - ☐ Strongly agree
   - ☐ Agree
   - ☐ Neutral
   - ☐ Disagree
   - ☐ Strongly disagree

---

4. I feel comfortable going into the libraries on campus to find resources for my studies.(choose one)
   - ☐ Strongly agree
   - ☐ Agree
   - ☐ Neutral
   - ☐ Disagree
   - ☐ Strongly disagree

---

5. Which libraries do you use to find information for your graduate coursework and/or research? (circle one choice for each library)

The D.B. Weldon Library	Very often	Often	Sometimes	Seldom	Never
Allyn & Betty Taylor Library	Very often	Often	Sometimes	Seldom	Never
Education Library	Very often	Often	Sometimes	Seldom	Never
Business Library	Very often	Often	Sometimes	Seldom	Never
Other library - please specify: _____	Very often	Often	Sometimes	Seldom	Never

---

6. How many times have you received instruction about how to use the information available to you through the library system at the University of Western Ontario ***since you began your graduate studies*** in the Department of Psychology?
   - ☐ 0
   - ☐ 1
   - ☐ 2
   - ☐ 3
   - ☐ 4+

7. How often have you used each of the following services when you were learning how to use the information available in and through the libraries at the University of Western Ontario? (circle one choice for each service)					
Library classes given by librarians	Very often	Often	Sometimes	Seldom	Never
One-on-one instruction from a librarian by appointment	Very often	Often	Sometimes	Seldom	Never
Assistance from librarians via chat reference	Very often	Often	Sometimes	Seldom	Never
Assistance from library staff at a workstation or reference desk / counter	Very often	Often	Sometimes	Seldom	Never
Assistance via email from library staff	Very often	Often	Sometimes	Seldom	Never
Online help for the library catalogue (via the *help* button or the *help with searching* link)	Very often	Often	Sometimes	Seldom	Never
Online help for library databases (e.g. PsycINFO)	Very often	Often	Sometimes	Seldom	Never
Online tutorials within databases (e,g. PsycINFO, PubMed)	Very often	Often	Sometimes	Seldom	Never
Print / online guides for library and web resources in a specific subject area or for a specific course (e.g. Resources by Subject - Social Science - Psychology)	Very often	Often	Sometimes	Seldom	Never

8. How often do you use the following sources to locate relevant information for your coursework and/or research? (circle one choice for each source)					
Online library catalogue	Very often	Often	Sometimes	Seldom	Never
Reference librarian	Very often	Often	Sometimes	Seldom	Never
Browsing shelves for books	Very often	Often	Sometimes	Seldom	Never
Scanning journal titles in print in the library	Very often	Often	Sometimes	Seldom	Never
Scanning online journal titles (e.g. electronic table of contents)	Very often	Often	Sometimes	Seldom	Never
Searching online databases (e.g. PsycINFO, PubMed)	Very often	Often	Sometimes	Seldom	Never
Peers	Very often	Often	Sometimes	Seldom	Never
Supervisor	Very often	Often	Sometimes	Seldom	Never
Thesis committee member	Very often	Often	Sometimes	Seldom	Never
Other faculty	Very often	Often	Sometimes	Seldom	Never
Other (please specify): _____	Very often	Often	Sometimes	Seldom	Never

9. When you need help finding relevant information for your coursework and/or research, who do you approach for assistance? (you may select more than one option if appropriate)
   - ☐ Reference librarian
   - ☐ Other library staff
   - ☐ Peers
   - ☐ Supervisor
   - ☐ Thesis committee member
   - ☐ Other faculty
   - ☐ Other (please specify): _____

10. When looking for information for coursework and/or research…. (circle one choice for each question)

how often do you use library resources by visiting the library in person?	Very often	Often	Sometimes	Seldom	Never
how often do you access library resources through a library Web page?	Very often	Often	Sometimes	Seldom	Never
how often do you use Yahoo™?	Very often	Often	Sometimes	Seldom	Never
how often do you use Google ™ or Google Scholar ™ ?	Very often	Often	Sometimes	Seldom	Never
how often do you use other non-library gateways/portals? (***not*** Yahoo™ or Google™) Name of gateway/portal(s): _____ _____	Very often	Often	Sometimes	Seldom	Never

11. Do you use software to manage your citations (e.g. Endnote, ProCite, RefWorks)?
   - ☐ Yes
   - ☐ No

→ **If yes**, please list the name(s) of the software that you use:

_____

→ **If yes**, how did you learn how to use this software: (you may select more than one option if appropriate)
   - ☐ Self-taught
   - ☐ Library session at UWO
   - ☐ Library session at other university
   - ☐ Peers
   - ☐ Supervisor
   - ☐ Thesis committee member
   - ☐ Other faculty
   - ☐ Other (please specify): _____

12. Do you currently use an electronic alerting service to inform you about updates on research topics (e.g. journal issue alerts, search alerts)?
    - ☐ Yes
    - ☐ No

If yes, how did you learn how to use this system: (you may select more than one option if appropriate)
- ☐ Self-taught
- ☐ Library session at UWO
- ☐ Library session at other university
- ☐ Peers
- ☐ Supervisor
- ☐ Thesis committee member
- ☐ Other faculty
- ☐ Other (please specify): _____

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13. I feel that for more effective and efficient use of the library, graduate students need instruction on how to find information available in their subject area for coursework and/or research: (please select one)
    - ☐ Strongly agree
    - ☐ Agree
    - ☐ Neutral
    - ☐ Disagree
    - ☐ Strongly disagree

---

14. What databases do you use to find information for coursework and/or research (e.g. PsycINFO, PubMed)?

Coursework:	Research:

---

15. Are there any ways in which you think that library services and/or resources could be improved to assist graduate students when looking for information for coursework and/or research?

_____

_____

_____

_____

_____

_____

Background information: (please select one for each)

16. Gender	☐ Male ☐ Female
17. Age	☐ 20-30 ☐ 31-35 ☐ 36-40 ☐ 41+
18. International student	☐ Yes ☐ No
19. Enrollment status	☐ Full-time ☐ Part-time
20. Year of study	☐ MSc1 ☐ MSc2 ☐ MSc3 ☐ PhD1 ☐ PhD2 ☐ PhD3 ☐ PhD4 ☐ PhD5 and above
21. Area of study	☐ Behavioural & Cognitive Neuroscience ☐ Clinical ☐ Cognition & Perception ☐ Social ☐ Personality & Measurement ☐ Developmental ☐ Industrial / Organizational

Thank you very much for completing this survey.
Your contribution is very important to improving library services.

****

Please return your completed questionnaire by **February 5th, 2007**,
in the enclosed, addressed, campus mailing envelope provided.

****

Marni Harrington, MLIS Candidate
c/o Jennifer Noon
Faculty of Information and Media Studies
North Campus Building
mharrin5@uwo.ca

Appendix 2 - Descriptive Statistics

FREQUENCY RESULTS

DEMOGRAPHIC INFORMATION:

GENDER

	Frequency	Percent
Male	13	36.1
Female	23	63.9
Total	36	100.0

→ **100% full-time enrolment**

THEME I: ATTITUDE

IMPORTANCE OF INFORMATION LITERACY FOR GRADUATE STUDENT:

Q1: I feel that it is very important that I exhaustively search the literature before I start a research project. (choose one)

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Agree	13	36.1	36.1	36.1
Agree	16	44.4	44.4	**80.6**
Neutral	3	8.3	8.3	88.9
Disagree	4	11.1	11.1	100.0
Total	36	100.0	100.0	

Q13: I feel that for more effective and efficient use of the library, graduate students need instruction on how to find information available in their subject area for coursework and/or research: (please select one)

		Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Agree		5	13.9	14.3	14.3
Agree		13	36.1	37.1	**51.4**
Neutral		14	38.9	40.0	91.4
Disagree		3	8.3	8.6	100.0
Total		35	97.2	100.0	
Missing	System	1	2.8		
Total		36	100.0		

PERCEIVED IMPORTANCE OF INFORMATION LITERACY FOR INSTRUCTORS, SUPERVISORS, REVIEWERS AND EDITORS:

Q2: I feel that it is very important to my instructors and supervisors that I correctly cite all relevant articles when I write course papers, theses, or research manuscripts. (choose one)

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Agree	28	77.8	77.8	77.8
Agree	8	22.2	22.2	**100.0**
Total	36	100.0	100.0	

Q3: I feel that it is very important to reviewers and editors that I correctly cite all relevant articles in my manuscripts that are submitted for publication. (choose one)

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Agree	32	88.9	88.9	88.9
Agree	4	11.1	11.1	**100.0**
Total	36	100.0	100.0	

THEME II: LIBRARY USE BEHAVIOUR

COMFORT LEVEL USING LIBRARY:

Q4: I feel comfortable going into the libraries on campus to find resources for my studies.(choose one)

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Agree	15	41.7	41.7	41.7
Agree	16	44.4	44.4	**86.1**
Neutral	5	13.9	13.9	100.0
Total	36	100.0	100.0	

Q5: Which libraries do you use to find information for your graduate coursework and/or research? (circle one choice for each library)

Library name / (n=?)	**Very often**	**Often**	**Sometimes**	**Seldom**	**Never**
The D.B. Weldon Library (36)	**61%**	**22%**	**14%**	**3%**	0
Allyn & Betty Taylor Library (36)	11%	11%	47%	17%	14%
Education Library (36)	0	2.8%	11%	36%	47%
Business Library (36)	5.6%	5.6%	2.8%	2.8%	81
Kings (1)	2.8%	0	0	0	0
Huron (5)	13.9%	0	0	0	0

USE OF LIBRARY ASSISTANCE:

Q7: How often have you used each of the following services when you were learning how to use the information available in and through the libraries at the University of Western Ontario? (circle one choice for each service)

SERVICE	Very often	Often	Sometimes	Seldom	Never
1. Library classes given by librarians (n=36)	5.6	0	25	22.2	44.4
2. One-on-one instruction from a librarian by appointment	0	0	2.8	11.1	86.1
3. Assistance from librarians via chat reference	0	0	5.6	13.9	80.6
4. Assistance from library staff at a workstation or reference desk / counter	**2.8**	**13.9**	**47.2**	22.2	13.9
5. Assistance via email from library staff	0	0	11.1	25	63.9
6. Online help for the library catalogue (via the help button or the help with searching link)	0	2.8	25	16.7	55.6
7. Online help for library databases (e.g. PsycINFO)	11.1	0	5.6	22.2	61.1
8. Online tutorials within databases (e.g. PsycINFO, PubMed)	0	0	5.6	16.7	77.8
9. Print / online guides for library and web resources in a specific subject area or for a specific course (e.g. Resources by Subject - social Science - Psychology)	0	2.8	8.3	19.4	69.4

USE OF SOURCES:

Q8: How often do you use the following sources to locate relevant information for your coursework and/or research? (circle one choice for each source)

INFORMATION SOURCES	Very often	Often	Sometimes	Seldom	Never
1. Online Library catalogue	**91.7**	5.6	2.8	0	0
2. Reference librarian	0	2.8	8.3	55.6	33.3
3. Browsing shelves for books	0	5.6	25	30.6	38.9
4. Scanning journal titles in the library	0	2.8	11.1	33.3	52.8
5. Scanning online journal titles (e.g. electronic table of contents)	16.7	11.1	36.1	19.4	16.7
6. Searching online databases (e.g. PsycINFO, PubMed)	**100**	0	0	0	0
7. Peers	5.6	25	41.7	16.7	11.1
8. Supervisor (58% often)	**11.1**	**47.2**	36.1	5.6	0

9. Thesis committee member	0	5.6	30.6	38.9	22.2
10. Other faculty	0	8.3	41.7	27.8	22.2
11. Google scholar (n=2)	2.8	2.8	0	0	0
12. Sources cited elsewhere (n=5)	8.3	2.8	2.8	0	0

USE OF ELECTRONIC VS. PHYSICAL RESOURCES:

Q10: When looking for information for coursework and/or research…. (circle one choice for each question)

Virtual vs. physical resources	Very often	Often	Sometimes	Seldom	Never
1. how often do you use library resources by visiting the library in person? (P)	**0**	**25**	**41.7**	**33.3**	**0**
2. how often do you access library resources through a library Web page? (V)	**91.7**	**5.6**	**2.8**	**0**	**0**
3. how often do you use Yahoo™? (V)	2.8	2.8	5.6	19.4	69.4
4. how often do you use Google ™ or Google Scholar ™ ? (V)	31.6	22.2	33.3	8.3	0
5. how often do you use other non-library gateways / portals (not Yahoo™ or Google™)? (V) (n=29)	5.6	0	8.3	8.3	58.3

THEME III: PROVISION OF INSTRUCTION

RECOGNIZED, FORMAL IL TRAINING:

Q6: How many times have you received instruction about how to use the information available to you through the library system at the University of Western Ontario ***since you began your graduate studies*** in the Department of Psychology?

No. of instructional sessions at UWO	Frequency	Percent	Valid Percent	Cumulative Percent
0	7	19.4	19.4	19.4
1	14	38.9	38.9	58.3
2	13	36.1	36.1	94.4
4+	2	5.6	5.6	100.0
Total	36	100.0	100.0	
				YES = 80.6% NO = 19.4%

PROVISION OF INSTRUCTION: (formal vs. informal)

Q9: When you need help finding relevant information for your coursework and/or research, who do you approach for assistance? (you may select more than one option if appropriate)

SOURCE	n	%
1. Reference librarian (formal)	13	36.1
2. Other library staff (f)	3	8.3
3. Peers(informal)	27	75
4. Supervisor (i)	**34**	**94.4**
5. Thesis committee member (i)	3	8.3
6. Other faculty (i)	13	36.1

OTHER IL SKILLS AND WHERE LEARNED: (formal vs. informal)

Q11.1: Do you use software to manage your citations (e.g. Endnote, ProCite, RefWorks)?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	19	52.8	52.8	52.8
	Yes	**17**	**47.2**	47.2	100.0
	Total	36	100.0	100.0	

Q11.3: If yes, how did you learn how to use this software: (you may select more than one option if appropriate)

SOURCE	n (of 17)	%
1. Self-taught (i)	14	38.9
2. Library session at UWO (f)	5	13.9
3. Library session at other university (f)	0	0
4. Peers (i)	2	5.6
5. Supervisor (i)	3	8.3
6. Thesis committee member (i)	0	0
7. Other faculty (i)	0	0

Q12.1: Do you currently use an electronic alerting service to inform you about updates on research topics (e.g. journal issue alerts, search alerts)?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**No**	31	**86.1**	88.6	88.6
	Yes	4	11.1	11.4	100.0
	Total	35	97.2	100.0	
Missing	System	1	2.8		
Total		36	100.0		

Q12.3: **If yes**, how did you learn how to use this system: (you may select more than one option if appropriate)

SOURCE	n (of 4)	%
1. Self-taught (i)	3	8.3
2. Library session at UWO (f)	0	0
3. Library session at other university (f)	1	2.8
4. Peers (i)	1	2.8
5. Supervisor (i)	0	0
6. Thesis committee member (i)	0	0
7. Other faculty (i)	2	5.6

Appendix 3: Inferential Statistics

DISTRIBUTION OF GROUPS

GROUP BY LEVEL: 3 Groups

	Frequency	Percent
MSc	15	41.7
PhD1_2	10	27.8
PhD3up	11	30.6
Total	36	100.0

GROUP BY LEVEL: 2 Groups

	Frequency	Percent
MSc	15	41.7
PhD	21	58.3
Total	36	100.0

GROUP BY AREA: NSERC (n=17) vs. SSHRC (n=19)

		Frequency
NSERC	BCN	3
NSERC	Cog & perc	14
SSHRC	Clinical	8
SSHRC	Social	4
SSHRC	Pers & Meas	2
SSHRC	IO	5
	Total	36

Chi-square analyses were used to calculate the following:

Who goes for training? (0, 1, 2+):
Q6 with levels χ^2 (4) = 5.10 p>0.2 (ns)
Q6 with MSc vs PhD χ^2 (2) = 2.71 p>.2 (ns)
Q6 with NSERC vs SSHRC (area) χ^2(2)=1.25 p>.5 (ns)

Who asks for help?
Q7.4 with levels χ^2(6) = 4.19 p>0.6 (ns)
Q7.4 with MSc vs PhD χ^2(3) =1.98 p>.5 (ns)
Q7.4 with NSERC vs SSHRC χ^2(3)=1.29 p>.7 (ns)

Use of supervisor to locate relevant info for coursework and / or research:
Q8.8 with levels χ^2(2) = 4.70 p>0.1 (ns)
Q8.8 with MSc vs PhD χ^2(1) =0.74 p>.3 (ns)
Q8.8 with NSERC vs SSHRC χ^2(1)=0.003 p>.9 (ns)

Who uses the reference librarian for assistance?
Q9.1 with levels χ^2(2) = 0.26 p>0.8 (ns)
Q9.1 with MSc vs PhD χ^2(1) =0.17 p>.6 (ns)
Q9.1 with NSERC vs SSHRC χ^2(1)=0.36 p>.5 (ns)

→ ***Who uses software to manage citations?***
Q11.1 with levels χ^2(2) = 4.24 p>0.1 (ns)
Q11.1 with MSc vs PhD χ^2(1) =3.90 p>.05 **(sig)**
- MSc 5 no, 10 yes / PhD 14 no, 7 yes

Q11.1 with NSERC vs SSHRC χ^2(1)=1.84 p>.1 (ns)

Q13. More effective and efficient use of library, graudate students need instruction:
- could not complete
- violates Cochrane's rule (less then 20% of the cells must have expected counts of 5 or less)

NOTES:

1. In most cases, not enough evidence to conclude that these variables are related.
2. Could not complete all analyses as n was not large enough.
3. Cannot make any solid conclusions due to null effects.

Appendix 4 - Qualitative Results

Male=1 Female =2	MSc1=1 MSc2=2 MSc3=3 PhD1=4P hD2=5 PhD3=6 PhD4=7 PhD5+=8	AREA: bcn=1 clinical=2 cog&perc=3 social=4 pers/meas=5 dev=6 IO=7	***QUALITATIVE DATA*** (NOTE: 21/36 subjects responded to this open-ended question) **Question 15:** Are there any ways in which you think that library services and/or resources could be improved to assist graduate students when looking for information for coursework and/or research?
THEME I: INSTRUCTION ISSUES (10/21 respondents)			
2	6	3	a resource librarian could be invited to orientation; or a yearly seminar to inform students of changes and new programs available (eg. alerting systems did not know it existed)
2	1	2	subject librarian could let more faculty know about their skills and then faculty could encourage their students to make use of the library services
1	2	2	more courses, small class size tailored learning to specific needs
2	1	3	would like info on electronic alerting services
1	4	1	alerting services would be nice to know how to use; are there other databases I should be using more exhaustively in my searching
1	4	5	I'd like to know more about alerting services
1	6	3	did not know there was such a thing as "alerts"
2	7	7	improve awareness of all services available
1	1	1	better learn how to use science databases (eg. ETOCs; reference management course)
2	6	4	ILL is hard to use with RACER; link RACER to PsycINFO; $5 cost very high;
THEME II: ACCESS ISSUES (10/21 respondents)			
1	1	4	get online access to journals more distant in time; publisher provides but library does not purchase
2	2	4	would like easier access to online articles at home (connection fails or articles often not available)
2	2	4	make more journals available online as complete PDF or html
1	5	3	more papers should be available online
2	6	2	more years to online journals
2	7	3	great if older journals were scanned and posted online to increase efficiency
2	4	7	I know the resources are there, I just don't use in-person resources often
1	4	3	mark online articles "people who selected this article, also selected or read this" like amazon.com
2	2	2	it would be good to have some medical journals at DBW
2	2	2	remote access annoying
THEME III: COMMENTS ONLY (1/21 respondents)			
2	6	2	amazing number of resources available, materials online, courses offered to grad students, refworks, etc.