

Dr. John Archer Library & Archives

**Longitudinal Informational Literacy Instruction Assessment: A Survey of University of Regina Faculty
of Education Graduate Students**

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Introduction

For the period January 2018 to January 2020, the University of Regina Dr. John Archer Library and Archives (Library) conducted a longitudinal research project of graduate students enrolled in the University Faculty of Education to determine the effectiveness of information literacy (IL) instruction, and in particular, the effect IL instruction has on students' abilities to retain and further develop their individual IL skills. Survey findings will highlight changes to be made to current IL programming to improve outcomes going forward. Markers for assessment included the priority areas identified in the Association of College and Research Libraries Framework for information Literacy for Higher Education (ACRL Framework) <https://www.ala.org/acrl/standards/ilframework>. Burgess (2015) discusses the merits of how the ACRL Framework can help guide librarians and instructors in designing curricula for students, and argues how this framework assists instructors in re-examining their teaching approaches:

“The Framework...is an opportunity for instructors to consider their own knowledge practices and dispositions by adopting a beginner's frame of mind, and to approach information literacy education as a discussion with fellow students—ones who just happen to be at a different point on the same path of lifelong learning.” (2)

Gross et al. (2018) come to a similar conclusion, stating:

“...the need to expand the teaching of information literacy beyond the Library, making librarians and faculty true partners in teaching information literacy, and embedding IL in programs of study across all levels of higher education.” (268)

Specific to this research project, the ACRL Framework helped identify broad themes that the researchers wanted to explore. A survey of 34 questions was developed within 9 broad categories to assess the students' current IL awareness and skills. Two Education Librarians and the Strategic Initiatives Librarian managed the project. Support from the Faculty of Education was needed in order for graduate students to participate in the study. The project was approved by the University's Research Ethics Board in December 2017.

Research Methodology

The researchers used Qualtrics to develop the 34 question survey and to collect the responses. The survey was promoted to 25 classes over 5 Terms: Winter 2018, Spring/Summer 2018, Fall 2018, Winter 2019, and Fall 2019. The two year period chosen to collect survey data was based on the typical time it takes a graduate student in the Faculty of Education to complete their degree program, giving the researchers an understanding of the progression of information searching behaviour/IL knowledge. The Library's close standing relationship with the Faculty of Education allowed this project to gain traction. The target audience comprised approximately 300 graduate students in the Faculty of Education. The same survey was administered each Term via e-mail to all Education graduate students in order to allow a comparison of findings and data. The number of one-time student participants in the survey is not known, nor the number of surveys that were not fully completed by participants due to the anonymous nature of the survey.

A link to the survey in Qualtrics was emailed to the Faculty Administrator who was responsible for forwarding the survey link to all Education graduate students. The survey took approximately 20 minutes to complete. As an incentive, the first 200 individuals to complete the survey received a \$5.00

Dine on Campus card. Students were given the option to withdraw from the survey at any point by closing their browser window. Survey results could not be withdrawn once the survey was submitted.

Faculty of Education instructors and the Librarians conducting the surveys did not know which students chose to participate, providing a safeguard against survey participation impacting course grades. The findings of this study will be made available to students, allowing them to better understand the scope of IL skills needed to successfully complete their graduate studies. Additionally, instructors will benefit from the findings as they will have access to the final report, highlighting areas of strength and those areas in need of further development.

The study will be published and made available in the University of Regina's open repository (oURspace) at the following link: <http://ourspace.uregina.ca/handle/10294/10>.

Literature Review

A review of the literature on information seeking behaviour and IL skills of graduate level students was conducted in June 2022. The only Library Science database that the researchers were able to access through the University of Regina was *Library, Information Science & Technology Abstracts* (LISTA) from EBSCOhost. 304 results were retrieved using the LISTA subject heading "IL research". Only 1 article was relevant to the topic of a longitudinal analysis of an IL program for the same student cohort in a Canadian academic Library. MacMillan (2014) led a five-year qualitative study that analyzed how journalism students learned to start successfully applying IL skills to complete class assignments and better problem-solve workplace scenarios.

Survey Findings

This section of the report discusses the survey findings for the period January 2018 through January 2020, a total of 5 Terms. 83 students from a total of 300 participated for a response rate of 27.7% (Table 1). The largest number of student participants by a significant margin was the first Term (Winter 2018) that the survey was distributed. The remaining four Terms of the survey's distribution had a student count between 9 and 18.

Winter 2018 had the lowest answer response rate in 11 of the 13 survey questions. Only 6 of those questions had response rates greater than 66%. However, that Term had the highest student participation rate of the five Terms that the survey was conducted. In other words, many opened the survey but students either left answers blank or commented *I don't know*. Survey fatigue may have been a reason for this phenomenon. Data sets for many of the survey questions are in Appendix C.

Table 1 Student participation by Term

Term	Percentage	Count
Winter 2018	38	32
Spring/Summer 2018	16	13
Fall 2018	11	9
Winter 2019	13	11
Fall 2019	22	18
Total	100	83

Research Queries

Nine broad research queries were developed to assess data that was collected from the five surveys. Relevant survey questions were grouped under those queries. There was some overlap with survey questions being in more than one research query. The complete survey is available in Appendix A and B.

1. What is the average amount of time that students spent out of University before they entered graduate school?
2. What are the most identifiable databases or search engines graduate students are aware of and use for searching academic information?
3. Is there a correlation between number of years since graduate students last attended University and their understanding of “Library”?
4. What are students’ understanding of carrying out a research assignment?
5. What are students’ understanding of the academic research process?
6. Is there a correlation between the number of instruction sessions attended and subsequent Library usage?
7. How do graduate students evaluate information?
8. What are graduate students’ understanding of the different types of information? Do students understand what constitutes academic literature?
9. What are students’ understanding building a successful search strategy?

Research query 1: What is the average amount of time that students spent out of University before they entered graduate school?

Survey question (Q) 3: How many years have passed since you last attended University and the beginning of your current program of study?

Observations: Based on the group of students that were surveyed, a majority of students had returned to University after a gap in attendance. The highest numbers since last attending were between 3-5 years (Table 2).

Table 2 Gap since last attended University

Gap	Percentage	Count
Less than a year	16	13
1-2 years	27	22
3-5 years	30	24
6 or more years	27	22

Research query 2: What are the most identifiable databases or search engines graduate students are aware of and use for searching academic information?

Q26:

Observations: Students were asked to name two databases they were aware of that could be used to conduct a search for academic materials. Education Resources Information Center (ERIC) was the most identified database, followed by Quick Find (Table 3). When IL sessions are delivered to Education students, ERIC is always demonstrated, so it is worth noting that instruction sessions appear to be raising awareness of academic databases that will help students with their research projects.

Table 3: Most identifiable databases

Database	Percentage	Count
ERIC	39	12
Quick Find (Library catalogue)	16	5
ProQuest	13	4
Google Scholar	13	4
JSTOR	7	2
Elsevier	3	1
Google	3	1
PsychInfo	3	1
Wiley	3	1

Research query 3: Is there a correlation between number of years since graduate students last attended University and their understanding of “Library”.

Q25 Can University of Regina students access Library materials that are not owned by the UofR?

Observations: Results from 4 survey questions analyzed for this research query showed there was no clear correlation between years since graduation and returning to University to students’ level of understanding of how to find specific types of resources in the Library. Survey question 25 showed that 68% of students had a basic understanding of how to find Library resources based upon their survey answers (Table 4). The number of correct answers per Term did not trend upwards during the course of the study (Table 5).

Table 4: Can University of Regina students access Library materials that are not owned by the UofR?

Term	Yes	No/not sure	Total count	Percentage
Winter 2019	3	3	6	50
Winter 2018	15	6	21	71
Spring/summer 2018	6	2	8	75
Fall 2018	5	3	8	63
Fall 2019	10	4	14	71

Table 5: Responses to question 25 by gap year

Option	Yes	Not sure	No
less than a year	75%	25%	0%
1-2 years	78%	8%	14%
3-5 years	61%	40%	0%
6 or more years	66%	29%	5%

Q26: Identify two Library resources that you can use to conduct secondary research

Observations: Survey results from Table 6 showed that students could identify databases and journals as appropriate sources to find academic literature. There was a fairly large group of students that had a gap of 1-2 years since last attending University that were unsure of how to answer the question.

Table 6: Identify two Library resources that you can use to conduct secondary research

Years since student last attended University	Databases	Journals	Newspapers	Archives	Other	Not Sure
less than a year	25%	50%	0%	0%	25%	0%
1-2 years	28%	35%	0%	0%	16%	21%
3-5 years	33%	13%	13%	7%	26%	8%
6 or more years	33%	26%	0%	0%	33%	8%

Q27: Identify one resource that can be used to locate academic journal articles

Observations: There were some gaps in identifying a resource to locate academic journal articles. A large percentage of students were unsure of how and where to look for academic journals. Table 7 illustrates the large percentage of students that did not provide an answer.

Table 7: Identify one resource that can be used to locate academic journal articles

Option	Identified a database	journals	database	not sure	other
less than a year	11%	22%	0%	56%	11%
1-2 years	28%	0%	21%	42%	9%
3-5 years	53%	8%	8%	8%	23%
6 or more years	18%	17%	18%	30%	17%

Q28: What information do you need to find a book in the University Library?

Observations: Table 8 shows that students were unfamiliar with knowing how keywords are used to find a book. The response *Not sure* was the most selected option, regardless of length of time students had last attended University. Needing a title or knowing the author was the top rated answer.

Table 8: What information do you need to find a book in the University Library?

Option	Call number	Title, author	Keywords	Other	Not sure
less than a year	23%	28%	7%	0%	42%
1-2 years	15%	33%	0%	6%	46%
3-5 years	18%	26%	4%	13%	39%
6 or more years	29%	31%	2%	2%	37%

Research query 4: What are students' understanding of carrying out a research assignment?

Observations: Four survey questions addressed research query 4.

Q25 - Can University of Regina students access Library materials that are not owned by the UofR?

Q26 - Identify two Library resources that you can use to conduct secondary research

Q27 - Identify one resource that can be used to locate academic journal articles

Q31 - You find 5 articles on your topic that were written by the same author. The articles cover all the information needed to write your paper. What are two problems with this scenario?

Regardless of the amount of time since last at a University, students appeared to have a very clear understanding of issues with using the same author and perspective to conduct comprehensive research.

Table 9 Thematic answers to question 31

Answer	Count
One perspective	21
Bias might be present	16
More resource give more credibility to your research	9
Does not give enough resources to understand the subject	8
Not sure	8
Limited understanding of the topic	6

Research query 5: What are students' understanding of the academic research process?

Observations: The survey questions below addressed research query 5:

Q11 - Where do scholars publish their research and why?

Q12 - What options are available for scholars to publish their work? Provide two options

Q13 - Why do scholars publish their research? Provide two answers

Survey results showed that a majority of students had a good understanding of the academic research process, finding, and identifying types literature. 58% of students recognized academic and scholarly journals as a place for academics to publish their research (Table 10). Very few students were able to identify other options for publication.

Table 10: What options are available for scholars to publish their work

Option	Percentage	Count
Online	8	5
Print	1.5	1
Academic Journals	58	36
Magazines	3	2
Conference	9.5	6
Books/Book Chapters	6	4
Open Source	6	4
Not Sure	8	5

Q13: What options are available for scholars to publish their work? Provide 2 options.

Observations: The wording in this question was similar to question 12 and the top two responses reflect this (Table 11). Another interesting phenomenon was the answer *open resources* (journals, access, educational resources) was mentioned in survey question 13 but not in survey question #12. But responses *online*, *website*, and *blog* were mentioned in both aforementioned questions. This may indicate that students didn't understand the granularity of online content (website, online journal, open access journal, and blog). 48 of 83 students provided comments over the course of the study for an average response rate of 58%.

Table 11: Answers for Q13

Answer	Count
Journals (incl. peer review-9, academic-7)	39
Books/textbooks	11
Open (journals, access, educational resources)	9
Online	8
Conference	6
Website	3
Blog	3
Publisher, self-publish	3
University	3

Research query #6: Is there a correlation between the number of instruction sessions attended and subsequent Library usage?

Observations: Three survey questions addressed research query 6

Q4: Have you received any instruction sessions provided by the Library since the beginning of your current program of study?

Q5: On average, how often do you use the University of Regina Library, whether in-person or online?

Q6: How important do you think information literacy skills are to complete your current program of study?

Although only 60% of the students surveyed where reached through Library instruction sessions (data collected from Q4), Tables 12, 13, and 14 show that students still accessed the library on a weekly basis and view information skills as “extremely important” as they worked to complete their program at the University.

Table 12: Have you received any instruction sessions provided by the Library since the beginning of your current program of study?

Option	Percentage	Count
Yes	43	22
No	47	24
Not Sure	10	5

Table 13: On average, how often do you use the University of Regina Library, whether in-person or online?

Option	Percentage	Count
Daily	20	10
3-4 times per week	34	17
1-2 times per week	24	12
1-2 times per month	8	4
Less than once a month	14	7

Table 14: How important are IL skills to complete your current program of study?

Option	Percentage	Count
Moderately important	8	4
No	25	13
Not Sure	67	34

Research Query 7: How do graduate students evaluate information?

Q14: List 3 criteria for evaluating information that you have found, regardless of format

Observations: The peer review process is emphasized in Library instruction sessions and it was mentioned in many responses. 52 of 83 students provided comments throughout the study for an average response of 63%.

Table 15 Thematic answers for Q14

Answer	Count
Peer reviewed	20
Reputable/reputation	10
Relevant/relevance	7
Methodology/methods	7
Reliability/reliable	4
Credibility/credible	4

Q30: You find an article on Google. How do you determine if the info. Is from a reliable source? Provide two ways to evaluate a source.

Observations: The words “peer review, reviewed” and “author” were the most frequent answers in Q30 (Table 16). The high peer review count was similar to results in survey question 14. 54 of 83 students provided comments throughout the study for an average response of 65%.

Table 16 Answers for Q30

Answer	Count
Peer review(ed)	19
Author	19
Source	16
Google Scholar	8
Library	4

Research Query 8: What is graduate students’ understanding of the different types of information? Do students understand what constitutes academic literature?

Q8: Which definition best describes the academic peer-reviewed process?

Observations: 92% of students who completed this question chose the correct answer (Table 17). This figure aligns with *peer reviewed* being the most frequent answer in survey questions 14 and 30. 73 of 83 students provided comments for an average response rate of 88%. Survey question 8 had the highest average response rate of any question throughout the course of this longitudinal study. With the exception of one Term, correct answers tracked upwards from 85% to 100% during this study.

Table 17 Which definition best describes the academic peer-reviewed process?

Answer	Percentage	Count
Scholars submit their research to a journal for publication and pay fees to have it published	0	0
Scholars submit their research for publication and a peer review process is undertaken to ensure the submission meets journal publication standards	92	67
Scholars research a topic that contributes to their field of study and submit copies of their research findings to as many journals as possible for publication	8	6

Q9: Which definition best describes grey literature?

Observations: Grey literature is another important concept that is explained in Library instruction sessions. 53 of 72 students correctly answered the question (Table 18). 72 of 83 students answered survey question 9 throughout the course of this study for an average response rate of 87%. This was the second highest response rate of any question in this longitudinal study. With the exception of one Term, correct answers tracked upwards from 65% to 87% during the entire survey period.

Table 18 Which definition best describes grey literature?

Answer	Percentage	Count
Grey literature is poor quality literature that isn't appropriate to support academic research and ideas	21	15
Grey literature is controlled by large publishing companies and can be found in the top academic journals	6	4
Grey literature can be document types on all levels that haven't gone through the traditional academic publishing process	74	53

Q10: What is a trade journal? Select all that apply.

Observations: Students should understand how grey literature differs from other published sources of information. While 74% of students knew the definition of grey literature based upon results in survey question 9, only 35% of students who answered question 10 chose the correct definition of a trade journal (Table 19). This number did not have a variance of more than 5% throughout the study. 70 of the 83 students provided comments throughout the course of this study for an average response of 84%.

Table 19 What is a trade journal? Select all that apply

Answer	Percentage	Count
Author is usually a professional in the field, sometimes a journalist with subject expertise	23	28
Articles are evaluated by peer-reviewers or referees who are experts in the field	16	19
Contains current news, trends, and products in a specific industry	35	42
It requires quotes and facts that are verifiable	8	9
Articles are evaluated by editorial staff who may be experts in the field	17	20

Q11: Why do scholars publish their research? Provide two answers.

Observations: Results indicate that students understood that the academic process of publishing builds upon the corpus of knowledge on a given topic. The response *contribution/contribute* (to the subject matter or research topic) was the most common answer at 14. More than 60 responses were distilled to 3 themes (Table 20). 63 of 83 students provided comments throughout the course of this study for an average response of 76%.

Table 20 Answers for survey question 11

Answer	Count
Share research	21
Career building	15
Contribute to field	11

Q12 Where do scholars publish their research and why?

Observations: The most cited answer to the first part of the survey question (Where do scholars publish their research) was “journals”. The combined number of other answers did not equal the top response (Table 21). These figures demonstrate the importance of explaining other publishing formats in IL sessions. Results are similar to those in survey question 13 because few students could identify publishing options besides in a journal. 54 of 83 students provided comments throughout the course of the study for an average response of 65%.

Table 21: Where do scholars publish their research?

Answer	Count
Journals	48
Books	9
Online	5
Conference	4
Presentation	2
Website	2
Magazine	2
Blog	2

The second part of Q12 was open-ended “Why do scholars publish research?”. 5 paraphrased themes were distilled from all the responses (Table 22). Some answers contained more than one theme and 14 students did not provide an answer.

Table 22 Paraphrased answers to why do scholars publish research?

Paraphrased answer	Count
Share research	17
(Academic) journals are reputable sources	11
Career building	8
Peer review	6

Survey question 16: Please provide a brief explanation of what open access is when speaking in regards to academic journals.

Observations: Two recurring concepts were identified. The first pertained to the concept of content being available to the general public. The word *anyone* was the most frequent response followed by synonyms *no affiliation* and *everyone* (Table 23). The word *free* was the second most frequent answer followed by three related Terms *no subscription*, *no fee*, and *unrestricted*. One answer stated that an institution pays a fee to allow access. 53 of 83 students answered question 16 over the course of the study for an average response rate of 64%.

Table 23 Answers for Q16

Answer	Count
Anyone	23
Free	12
No subscription	9
No fee	5
(No) affiliation	3
Everyone	3
Unrestricted	2

Q29: You are identifying research articles for a literature review. Would this be considered primary or secondary research?

Observations: Results showed there was not a progression of correct answers chosen each Term. The average correct response rate was only 46%.

Research Query 9: What are students’ understanding building a successful search strategy?

Preamble for Q21: Please answer the four questions below based on this research question: You are asked to find current literature on how the use of mobile devices is changing the way high school programs are designed and run. An increasing number of high school students use mobile devices and often bring them to the classroom. Teachers have been considering ways to incorporate these devices into teaching methods.

Q21: Select the top TWO key concepts that you would use as keywords in a search engine to get the best results.

Observations: Two key concepts selected for a search were: mobiles AND teaching methods followed by the search phrase: mobiles AND high school (Table 24). The two most frequent words provided, together and separately in answers, were “mobile devices” and “teaching methods” (Table 31). 59 of 83 students answered question 21 over the course of the study for an average response of 71%.

Table 24: Key concepts for survey Q21

Answer	Percentage	Count
Mobiles and teaching methods	54	32
Mobiles and high school	32	19

Table 25: Answers for Q21

Answer	Percentage	Count
Mobile devices	46	55
Teaching Methods	30	36
High school	18	22
Current literature	4	5
Change	2	2

Q22: Expand the keyword "Mobile Devices" by using synonyms and alternate Terms. Provide 2 examples.

Observations: There was no discernable answer that had two recurring alternate Terms. The single most common synonym by a significant count was *cell/cellular phone* (Table 26). Apple was the only proprietary device listed in answers. 59 of 83 students answered question 22 over the course of the study for an average response of 71%.

Table 26: Answers for Q22

Answer	Count
Cell/cellular phone	40
Smart phone	11
Mobile phone	6
Tablet	6
iPhone	5
iPad	5

Q23: How would you construct your research strategy using Nesting (brackets and quotations) and Boolean operators (AND, OR, NOT)? Please write out your search strategy using three of the keywords or synonyms you identified above:

Observations: Q23 was one of the most challenging ones in the entire survey. Many students had a general understanding of drafting a search strategy and most used the three keywords listed below in bullets.

- cell phones
- teaching methods
- high school

Many students came close to drafting a proper search but had difficulty properly using quotation marks, parentheses, and Boolean operators. Library IL sessions may need to better explain how using synonyms, quotations, and brackets can build superior searches.

41 of 83 students answered question 23 over the course of the study for an average response of 49%. This was the lowest response rate for any survey question from survey research queries 7, 8, and 9. Only 3 students correctly drafted an effective keyword search.

Q24: Based on this research question, identify a background question or additional information that may be needed in order to begin your literature search.

Observations: Similar to Q23, this question was somewhat challenging. It was not possible to distill broad themes but some well-constructed answers are:

- What effect of socioeconomic status is there in mobile device users in high school?
- How is the use of mobile devices impacting student learning?
- How the use of mobile devices is changing the way high school programs are designed and run?
- Does personal technology usage improve or hinder classroom learning? What apps are available to aid in classroom learning?

- I'd be curious to see how classroom participation has increased or decreased since cell phones and laptops have become ubiquitous. First we need to know the impact so far and what has been done up until this point.
- The effect of digital technology on teaching methods
- School board administration procedures as to whether students are allowed to bring devices; how precious teachers have used devices in the classroom; what challenges classroom teachers have noted using devices (social media access, increase in VTRAs, etc.)

This survey question required some critical thinking skills to draft an answer. Responses indicate some difficulty in researching a topic, developing keywords and synonyms, narrowing and expanding a research query. 43 of 83 students answered question 24 over the course of the study for an average response of 52%. This is the second lowest response rate for any survey question from research queries 7, 8, and 9.

Q32: Which definition best describes “natural language”?

Observations: Only 55% of students correctly answered the question that it is *A language developed naturally, rather than by computer or code*. Results showed there was not a progression of correct answers selected in each Term throughout the study.

Q33: Many databases use controlled vocabulary to help scholars find literature. Which definition best describes controlled vocabulary in a database setting?

Observations: 53% of students chose the correct answer *Words and phrases used to index literature*. Results showed there was not a progression of correct answers selected in each Term throughout the study.

Q34: Boolean Operators can be used in conjunction with keywords to develop a search string to be used with a search engine. Which of the following examples retrieve the most comprehensive set of search results?

Observations: 70% of students chose the correct keyword search. Results showed there was not a progression of correct answers selected in each Term throughout the study.

Challenges

There were two questions from the study that were not answered. The first was research query 6 “Is there a correlation between the number of instruction sessions attended and subsequent Library usage?” Results from survey questions 4, 5, and 6 were inconclusive in determining if Library usage increased because there was no method to effectively track and cross tabulate survey results.

The second question was if there was a chronological increase of correct answers in each survey from Winter 2018 to Fall 2019. Results from survey questions 8, 9, 25, 29, 32, 33, and 34 required single answers that tested students’ knowledge of library resources, services and building a search. Unfortunately results were inconclusive. Only question 8 tracked an increase in correct answers and question 9, with the exception of one Term, also tracked an increase.

Recommendations

The researchers recommend that librarians explore more ways to collaborate with instructors to strengthen assignments by ensuring Library resources and services must be used. This will help improve the quality of assignments. Librarians should apply IL strategies such as constructing a research question, targeting appropriate Library databases for locating and evaluating primary and secondary sources, and explaining some external sources like Google Scholar.

Conclusion

Research team members gained a better understanding of graduate students' knowledge of IL concepts before and after receiving one Library instruction session. There was no strong correlation between student IL skills and information searching behaviour noticeably improving during this study. Potential reasons include the combination of students who had been in the workplace and returning to University after a significant period of time to those who recently completed their undergraduate degree. Survey response rates also generally decreased between the first and last Term of this study.

A majority of students understood IL concepts such as peer-review, grey literature, open access, and some publishing formats. But understanding the cyclical nature of researching a topic, narrowing and/or expanding it before finalizing their research query using Boolean Operators was less clear.

At the time of this report's publication, the Library is expanding services and supports to students enrolled in the Faculty of Education. These include an array of materials in different formats for the Education Core Studies (ECS) at the undergraduate level. Librarians continue to evolve IL modules in collaboration with Education instructors who did not participate in this study.

The *electronic Teach, Lead and Learn* (eTLL) Portal was launched during Summer 2022, and was developed by a team of Education professors and Librarians Michael Shires and Gillian van der Ven. The portal comprises interactive modules that build on skills learned in academic integrity, citing, and using the Library. eTLL is accessible in URCourses (<https://urcourses.uregina.ca/course/view.php?id=21392A>) and all Education graduate students are required to complete all modules.

A longitudinal tool to track and analyze results of eTLL in combination with a future ECS program may contribute significantly to the efficacy of IL supports for the Faculty of Education. The researchers of this study recommend to imbed this tool into IL programming to analyze the impact of eTLL in combination with ECS program.

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Appendices

Appendix A - Survey email message to students

The University of Regina Library is conducting research on the impact of IL session on graduate students at the University of Regina. The purpose of this study is to determine the effect Library instruction has on student's ability to retain and develop IL skills, thus influencing how the Library offers IL instruction.

If you would like to participate in this study by filling out the questionnaire please visit the link below. If you choose to you can enter your email address at the end to receive a \$5.00 Tim Hortons card for completing the survey.

Please direct any questions to gillian.vanderven@uregina.ca

Appendix B - Survey Questions

Q2 What level of education are you currently in?

- Graduate studies first year
- Graduate studies second year
- Graduate studies third year
- Graduate studies fourth year or more

Q3 How many years have passed since you last attended University and the beginning of your current program of study?

- Less than a year
- 1-2 years
- 3-5 years
- 6 or more years

Q4 Have you received any instruction sessions provided by the Library since the beginning of your current program of study?

- Yes
- No
- Not sure

Q5 On average, how often do you use the University of Regina Library, whether in-person or online?

- Daily
- 3-4 times a week
- 1-2 times a week
- 1-2 times a month
- Less than once a month

Q6 How important do you think information literacy skills are to complete your current program of study?

- Extremely important
- Very important
- Moderately important
- Slightly important
- Not at all important

Q7 How important do you think information literacy skills will be in your career beyond University?

- Extremely important
- Very important
- Moderately important
- Slightly important
- Not at all important

Q8 Which definition best describes the academic peer-reviewed process?

- Scholars submit their research to a journal for publication and pay fees to have it published
- Scholars submit their research for publication and a peer review process is undertaken to ensure the submission meets journal publication standards
- Scholars research a topic that contributes to their field of study and submit copies of their research findings to as many journals as possible for publication

Q9 Which definition best describes grey literature?

- Grey literature is poor quality literature that isn't appropriate to support academic research and ideas
- Grey literature is controlled by large publishing companies and can be found in the top academic journals
- Grey literature can be document types on all levels that haven't gone through the traditional academic publishing process

Q10 What is a trade journal? Select all that apply.

- Author is usually a professional in the field, sometimes a journalist with subject expertise
- Articles are evaluated by peer-reviewers or referees who are experts in the field
- Contains current news, trends, and products in a specific industry
- It requires quotes and facts that are verifiable
- Articles are evaluated by editorial staff who may be experts in the field

Q11 Why do scholars publish their research? Provide two answers.

Q12 Where do scholars publish their research and why?

Q13 What options are available for scholars to publish their work? Provide 2 options.

Q14 List 3 criteria for *evaluating* information that you have found, regardless of format.

Q15 The Journal of Educational Action Research is not accessible to all individuals outside of the University of Regina. Select all that may apply:

No computer/internet access

No subscription access

The journal is open access

Q16 Please provide a brief explanation of what open access is when speaking in regards to academic journals.

Q17 What are some of the reasons an individual may choose not to go through the peer-reviewed process when publishing an article? Select all that apply:

Costs are too high to publish in the journal they are interested in

Their topic is timely and the peer-review process is too long

The peer-reviewed process is not very well respected in the academic community

The audience they are trying to reach differs from the standard academic community

Q18 Scenario: You want to use an image from an academic article in your research paper. Select all that comply with Canadian Copyright Law:

- Less than 10% of the article's content so you can add it in your article without referencing
- Add the image with proper attribution
- No need to cite if only a portion of the image is used

Q19 Why would one use citations when referencing the work of others in one's research? Select one or more that apply:

- It shows you have thoroughly done your research
- Gives credit to the ideas of others
- It is a part of every research paper's overall structure
- It lends credibility to your research
- References help you achieve the paper's minimum word count

Q20 Sample research question: You are asked to find current literature on how the use of mobile devices is changing the way high school programs are designed and run. An increasing number of high school students use mobile devices and often bring them to the classroom. Teachers have been considering ways to incorporate these devices into teaching methods.

Please answer the four questions below based on this research question:

Q21 Select the top **TWO** key concepts that you would use as keywords in a search engine to get the best results:

- Mobile devices
- High school
- Current literature
- Change
- Teaching methods

Q22 Expand the keyword "Mobile Devices" by using synonyms and alternate terms. Provide 2 examples:

Q23 How would you construct your research strategy using Nesting (brackets and quotations) and Boolean operators (AND, OR, NOT)? Please write out your search strategy using three of the keywords or synonyms you identified above:

Q24 Based on this research question, identify a background question or additional information that may be needed in order to begin your literature search.

Q25 Can University of Regina students access library materials that are not owned by the U of R Library?

- No
- Not sure
- Yes

Q26 Identify two library resources you can use to conduct secondary research in your area of study.

Q27 Identify one resource that can be used to locate academic journal articles?

Q28 What information do you need to find a book in the University Library?

Q29 You are identifying research articles for a literature review. Would this be considered primary or secondary research?

- Primary
- Secondary
- Other

Q30 You find an article on Google. How do you determine if the information is from a reliable source? Provide two ways to evaluate a source:

Q31 You find 5 articles on your topic that were written by the same author. The articles cover all the information needed to write your paper. What are two problems with this scenario?

Q32 Which definition best describes “natural language”?

- Slang
- A language developed naturally, rather than by computer or code
- The first language you learned growing up

Q33 Many databases use controlled vocabulary to help scholars find literature. Which definition best describes controlled vocabulary in a database setting?

- Word that academics have selected
- Words and phrases used to index literature
- Words and phrases that come from the title of the article

Q34 Boolean Operators can be used in conjunction with keywords to develop a search string to be used with a search engine. Which of the following examples retrieve the most comprehensive set of search results?

- Mathematics and new ways students are using technology
- Mathematics AND Technology OR Students
- Mathematics AND Technology AND (Students OR Teachers)

Appendix C - Selected survey question data sets

Q5: On average, how often do you use the University of Regina Library, whether in-person or online?

Option	Yes	Not sure	No
less than a year	75%	25%	0%
1-2 years	78%	8%	14%
3-5 years	61%	40%	0%
6 or more years	66%	29%	5%

Q8: Which definition best describes the academic peer-reviewed process?

Answer response by Term

Term	Percentage
Spring/Summer 2018	100
Fall 2018	100
Fall 2019	89
Winter 2019	82
Winter 2018	81

Correct answer by Term

Term	Total count	Correct count	Percentage
Fall 2019	16	16	100
Winter 2019	9	9	100
Spring/Summer 2018	13	12	92
Fall 2018	9	8	89
Winter 2018	26	22	85

Q9: Which definition best describes grey literature?

Answer response by Term

Term	Percentage
Spring/Summer 2018	100
Fall 2018	100
Fall 2019	83
Winter 2019	81
Winter 2018	81

Correct answer by Term

Term	Total count	Total correct	Percentage
Fall 2019	15	13	87
Winter 2019	9	7	78
Spring/Summer 2018	13	10	77
Fall 2018	9	6	67
Winter 2018	26	17	65

What is a trade journal? Select all that apply

Answer	Count
Articles are evaluated by peer-reviewers or referees who are experts in the field	8
Contains current news, trends, and products in a specific industry	26
Author is usually a professional in the field, sometimes a journalist with subject expertise	24
Articles are evaluated by editorial staff who may be experts in the field	9
It requires quotes and facts that are verifiable	2
Gone through the traditional academic publishing process	1

Answer response by Term

Term	Percentage
Spring/Summer 2018	100
Fall 2018	100
Fall 2019	83
Winter 2019	82
Winter 2018	75

Q11: Why do scholars publish their research? Provide two answers

Answer response by Term

Term	Response percentage
Spring/Summer 2018	100
Fall 2018	78
Winter 2019	73
Fall 2019	72
Winter 2018	69

Q12: Where do scholars publish and why?

Answer response by Term

Term	Response percentage
Fall 2018	78
Winter 2019	73
Spring/Summer 2018	69
Fall 2019	67
Winter 2018	56

Q12: (part 2) Why do scholars publish their research?

Answer
accepted norm
For others to use
Academics read them
credibility
encourage interchange of information from their peers as there will be responses from peers who may agree or (sic) disagree with their published work
Peer review (process)
so like-minded people can best find it and benefit.
common place to look for research and contribute
Good reputation
high impact factors to ensure more readability
Ensures research is held to a high standard and rigor.
advance research, share knowledge and become recognized and acknowledged for their contributions to their field of study
Easier to be referred
Peer reviewed journals are reputable
ensure the integrity of their research is intact and available to others, to learn.
People in their fields read academic journals
Scientific journals ensure quality of information shared
That is the process that has been established for such work
Ensures peer review and targets and academic audiences.
meet academic requirements of their employment.
Online in OER journals to share their findings. On blogs and websites to develop a portfolio.
Reach different audiences for different purposes.
contribute to the field of study
to reach the greatest number of relevant readers
get peer recognition, support and attention.

contribute to their specific field and help the further progress as well as it helps someone during their literature review from their field of their results.
make their contributions visible
experience peer review from other scholars
to be evaluated by experts in that area and for more validity
Depends on the field of research. Most see value in publications in journals, other believe policy and community reports (accessible media which can be put into action) are a better fit for publication.
Journals, because they're considered more authoritative (sic).
For communicating their work to the world.
Academic journals, because they are peer reviewed, credible sources
In peer-reviewed articles, so that others in the field know the research is reliable
share what they have found, to get recognition, because it is required for employment

Q13: What options are available for scholars to publish their work? Provide 2 options.

Answer response by Term

Term	Response %
Winter 2019	82
Fall 2018	78
Spring/Summer 2018	62
Fall 2019	61
Winter 2018	41

Thematic answers

Answer	Count
Journals	19
Academic Journals	12
Online	4
Open Journal	2
Web	3
Peer-reviewed journals	14
Conferences	4
Not sure	2

Q14: List 3 criteria for evaluating information that you have found, regardless of format.

Answer response by Term

Term	Percentage
Winter 2019	91
Fall 2018	78
Spring/Summer 2018	69
Fall 2019	61
Winter 2018	47

Q16: Please provide a brief explanation of what open access is when speaking in regards to academic journals.

Answer response by Term

Term	Response percentage
Winter 2019	73
Spring/Summer 2018	69
Fall 2019	67
Winter 2018	59
Fall 2018	56

Q21: Select the top TWO key concepts that you would use as keywords in a search engine to get the best results:

Answers for Q21

Answer	Percentage	Count
Mobile devices	46	55
Teaching Methods	30	36
High school	18	22
Current literature	4	5
Change	2	2

Answer responses for Q21

Term	Response percentage
Fall 2018	89
Fall 2019	78
Spring/Summer 2018	69
Winter 2018	66
Winter 2019	64

Q22: Expand the keyword "Mobile Devices" by using synonyms and alternate terms. Provide 2 examples:

Answer responses by Term

Term	Response percentage
Fall 2019	72
Spring/Summer 2018	69
Fall 2018	67
Winter 2019	64
Winter 2018	56

Q23: How would you construct your research strategy using Nesting (brackets and quotations) and Boolean operators (AND, OR, NOT)? Please write out your search strategy using three of the keywords or synonyms you identified above:

Answer response by Term

Term	Response percentage
Spring/Summer 2018	62
Fall 2018	56
Winter 2019	55
Winter 2018	44
Fall 2019	44

Correct answer by Term

Term	Total count	Correct count	Percentage
Fall 2018	5	1	20
Spring/Summer 2018	8	1	12.5
Winter 2018	14	1	7
Fall 2019	8	0	0
Winter 2019	6	0	0

Q24: Based on this research question, identify a background question or additional information that may be needed in order to begin your literature search.

Answer response by Term

Term	Response percentage
Fall 2018	78
Fall 2019	67
Winter 2019	64
Spring/Summer 2018	46
Winter 2018	34

Q25: Can University of Regina students access Library materials that are not owned by the UofR?

Correct answer response by Term

Term	Yes	No/not sure	Total count	Percentage
Winter 2019	3	3	6	50
Winter 2018	15	6	21	71
Spring/summer 2018	6	2	8	75
Fall 2018	5	3	8	63
Fall 2019	10	4	14	71

Q29: You are identifying research articles for a literature review. Would this be considered primary or secondary research?

Correct answer response by Term

Term	Correct answer: primary research	Secondary	Total count	Percentage
Fall 2018	3	5	8	63
Winter 2019	3	3	6	50
Spring/Summer 2018	4	4	8	50
Winter 2018	12	9	21	43
Fall 2019	8	5	13	38

Q31: You find 5 articles on your topic that were written by the same author. The articles cover all the information needed to write your paper. What are two problems with this scenario?

Answer response by Term

Term	Percentage
Fall 2018	78
Fall 2019	72
Spring/Summer 2018	62
Winter 2019	55
Winter 2018	53

Q32: Which definition best describes “natural language”?

Correct answer response by Term

Term	Correct answer: A language developed naturally, rather than by computer or code	Total count	Percentage
Fall 2018	7	8	88
Fall 2019	8	14	57
Winter 2019	8	14	57
Winter 2018	9	20	45
Spring/Summer 2018	3	8	38

Q33: Many databases use controlled vocabulary to help scholars find literature. Which definition best describes controlled vocabulary in a database setting?

Thematic answers

Answer	Count
Does not give enough resources to understand the subject	8
Bias might be present	16
More resource give more credibility to your research	9
One perspective	21
Limits understanding of the topic	6
Not sure	8

Correct answer responses by Term

Term	Correct answer	Total count	Percentage
Fall 2018	6	8	75
Spring/Summer 2018	6	8	75
Winter 2018	13	20	65
Fall 2019	9	14	64
Winter 2019	9	14	64

Q34: Boolean Operators can be used in conjunction with keywords to develop a search string to be used with a search engine. Which of the following examples retrieve the most comprehensive set of search results?

Correct answer response by Term

Term	Correct answer: Mathematics AND Technology AND (Students OR Teachers)	Total count	Percentage
Spring/Summer 2018	8	8	100
Fall 2018	5	6	83
Winter 2018	14	19	74
Fall 2019	8	14	57
Winter 2019	8	14	57