Partnership
Canadian journal of library and information practice and research
Revue canadienne de la pratique et de la recherche en bibliothéconomie et sciences de l'information

Academic Librarian Collaborations in Inquiry Based Learning: A Case Study, Reflections and Strategies

Collaborations entre bibliothécaires universitaires dans le cadre de l'apprentissage fondé sur le questionnement : une étude de cas, des réflexions et des stratégie

James E. Murphy, Laura Koltutsky, Bartlomiej Lenart, Caitlin McClurg et Marc Stoeckle

Volume 15, numéro 2, 2020

URI : https://id.erudit.org/iderudit/1074629ar
DOI : https://doi.org/10.21083/partnership.v15i2.5732

Aller au sommaire du numéro

Éditeur(s)

The Partnership: The Provincial and Territorial Library Associations of Canada

ISSN

1911-9593 (numérique)

Découvrir la revue

Citer cet article

Murphy, J., Koltutsky, L., Lenart, B., McClurg, C. & Stoeckle, M. (2020). Academic Librarian Collaborations in Inquiry Based Learning: A Case Study, Reflections and Strategies. *Partnership*, *15*(2), 1–21. https://doi.org/10.21083/partnership.v15i2.5732

Résumé de l'article

Cinq bibliothécaires universitaires de la University of Calgary ont été invités à collaborer sur un cours conçu sur l'apprentissage fondé sur le questionnement. Chaque bibliothécaire avait des responsabilités de liaison et des compétences différentes et était associé à une section de cours composée principalement d'étudiants de première année, d'un instructeur et d'un assistant d'enseignement. La diversité des expériences des bibliothécaires a permis de mieux comprendre les questions de partenariats avec la bibliothèque, de bibliothéconomie intégrée et d'enseignement de la maîtrise de l'information. Les avantages de la collaboration comprennent des possibilités d'enseignement, des perceptions positives des étudiants, le renforcement des compétences et des innovations en matière d'enseignement, tandis que les domaines à développer comprennent la durabilité et la définition des rôles. Les domaines de croissance future proposés comprennent l'exploration quantitative de l'implication des bibliothécaires dans l'apprentissage fondé sur le questionnement.

PARTNERSHIP
The Canadian Journal of Library and Information Practice and Research
Revue canadienne de la pratique et de la recherche en bibliothéconomie et sciences de l'information

vol. 15, no. 2 (2020)
Innovations in Practice (peer-reviewed)
DOI: https//doi.org10.21083/partnership.v15i2.5732

Academic Librarian Collaborations in Inquiry-based Learning: A Case Study, Reflections, and Strategies

James E. Murphy
Assistant Librarian (Art, Architecture)[1]
james.murphy2@ucalgary.ca

Laura Koltutsky
Associate Librarian (Sociology, Psychology)[1]

Bartlomiej Lenart
Assistant Librarian (Education, Philosophy)[1]

Caitlin McClurg
Associate Librarian (Engineering)[1]

Marc Stoeckle
Assistant Librarian (Music, Foreign Languages)[1]

Abstract

Five academic librarians at the University of Calgary were invited to collaborate on an inquiry-based learning course. Each librarian represented different liaison responsibilities and expertise and was paired with a course section of primarily first-year students, an instructor, and a teaching assistant. The range of experiences among the librarians provided insights into issues of library partnerships, embedded librarianship, and information literacy instruction. Benefits of the collaboration included opportunities for instruction, positive student perceptions, skill building, and teaching innovations, while areas for further development included sustainability and role definition. Proposed

[1] Libraries and Cultural Resources. University of Calgary. Calgary, Alberta.

areas of future growth include quantitative exploration of librarian involvement in inquiry-based learning.

Keywords

Information literacy, librarian-instructor collaboration, library instruction, academic librarianship, inquiry-based learning (IBL), embedded librarianship, scholarship of teaching and learning (SoTL)

Introduction

The University of Calgary offers an inquiry-based learning course, UNIV 201, organized through the College of Discovery, Creativity, and Innovation at the Taylor Institute for Teaching and Learning (TI). This inquiry-based learning (IBL) course focuses on a global challenge, such as “Feeding Nine Billion People by 2050,” and it is offered exclusively to first-year undergraduate students, introducing them to IBL from an interdisciplinary perspective. These undergraduate students from a variety of academic disciplines and programs are encouraged to approach the global challenge from many perspectives. Content is presented through “instructional practices designed to promote high order intellectual and academic skills through student-driven and instructor-guided investigations of student (or instructor) generated questions” (Justice et al., 2009, p. 843).

This article explores the experiences of five librarians from Libraries and Cultural Resources (LCR) who collaborated with the IBL program. In Fall 2018, all sections of UNIV 201 were paired with a librarian. This paper reports on the librarians’ experiences in UNIV 201 using scholarship of teaching and learning (SoTL) methodology, which encourages educators to understand teaching as an ongoing investigation in pursuit of how to continually foster better learning (Bass, 1999). With these SoTL goals in mind, this paper investigates how to improve learning environments by exploring the challenges librarians faced in UNIV 201. The authors reflect on teaching practice broadly construed, and, like Bass (1999), we “think of teaching practice, and the evidence of student learning, as problems to be investigated, analyzed, represented, and debated” (p. 1). The collaboration has been a positive and interesting experience that has fostered our own innovative thinking and approaches to information literacy (IL) and allowed us to build relationships with faculty, instructors, and new students across disciplines.

This paper discusses the benefits and areas for improvement in IBL collaborations as well as sustainability issues, strategies for future collaboration, and insights for librarians partnering with teaching and learning departments. We explore whether and how the embedded approach changed when applied to inquiry-based instructional courses. As librarians, we sought both to be involved in conversations in the early stages of course planning and to reflect on our varied experiences during the semester in order to shape optimal future involvement in these new courses. We identify ways to move forward as

we contemplate the future of library partnerships in IBL and collaborative approaches as well as implications for future research.

Background

In Fall 2017, one librarian was embedded full-time into the UNIV 201 IBL course for one academic term. The embedded librarian supported course participants on a weekly basis in class because research has shown that one-shot instruction sessions are often deemed insufficient in the development of IL skills (Bowles-Terry & Donovan, 2016; Mery et al., 2012). The full-time presence of a librarian within an IBL course is unique within both the University of Calgary context and the research literature.

UNIV 201 learning outcomes in the 2018/19 academic year were:

- Identify the social, political, economic, cultural, and scientific features of the global challenge at local, national, and global levels
- Demonstrate a personalized approach to visualizing concepts and ideas
- Conduct an effective search for evidence to inform personal perspectives with respect to the global challenge
- Evaluate the quality and reliability of evidence stemming from both peer reviewed and popular sources
- Identify multiple perspectives (individual, group, disciplinary, and societal) related to the global challenge
- Communicate a specific area of interest or “niche” within the global challenge
- Develop an effective and meaningful inquiry question
- Demonstrate developing reflective writing capacity, including a critical assessment about the self in relation to the global challenge
- Select, present, and justify evidence of learning
- Generate creative and innovative ideas to address the global challenge
- Describe the ethical issues and considerations associated with innovating in the area of the global challenge, which includes the area of stewardship and global citizenship
- Implement a plan to consult with at least one stakeholder from the broader community to gather information and perspectives regarding an innovative idea

- Propose an innovative idea that addresses a meaningful and manageable aspect of the global challenge (R. Mueller, personal communication, September 14, 2018).

A year later in Fall 2018, five sections of UNIV 201 were offered as the course grew. Conversations between the TI and LCR resulted in increased collaboration and an embedded librarian in each of the five sections. This full-scale integration created an interesting diversity of experiences as all five sections were arranged with instructors and librarians from differing interdisciplinary backgrounds, research interests, and approaches. Fall 2018 was the first time the course was taught by instructors previously uninvolved in the initial course development. Only one of the five instructors had previous teaching experience in an IBL environment. Also, only one of the five librarians had previously been involved in the course. Still, librarian and instructor teams were able to draw on experiences of the teaching team in previous academic years. Each instructor received a course outline and teaching material to support their section of the course. The collaboration between instructor and librarian varied between sections; however, all instructors were appreciative and excited about the availability of a full-time embedded librarian in their course.

Two sections held classes for 3 hours once a week, and three sections held classes for 1.5 hours twice a week. Classes were primarily held during work hours, but some extended into the evening. Each librarian selected the course that fit best with their schedule so they could attend classes on a weekly basis throughout the term. Librarians working with either schedule faced challenges. Those who committed to the entire 3-hour evening faced a very long weekly workday, while those who attended the daytime classes faced the complications of working around other commitments.

The selection process also led to collaborations between instructors and librarians with diverse backgrounds. For example, the Fall 2017 pairing was between the music librarian and the faculty member who developed the course, whose expertise is in organizational learning and development. The five librarians informed library managers of the collaboration, and the managers were supportive.

The vision of collaboration was flexible and open to dialogue as librarians were collaborators and not instructors of record. Each instructor and librarian pair decided independently of other sections how to structure their teaching. In one example, during each class the librarian roamed around the classroom assisting students with literature evaluation and search strategies. The librarian shared feedback from this section in a meeting with the instructor on a bi-weekly basis to evaluate student learning and group project development. In another section, the librarian was more passive during class time but taught scheduled IL instruction in the form of recurring workshops and lectures throughout the term.

Literature Review

Embedded Instruction

Librarians have succeeded in embedding themselves in many types of academic instruction. As Dewey (2004) suggested, “[a] proactive approach is essential in getting one or more seats at the right tables” (p.10). Drewes and Hoffman (2010) asserted that liaison and branch librarians have been embedding themselves into their respective faculties for a long time without necessarily labeling it as such. Librarians at the University of Calgary, as at other academic institutions, have a long history of collaborating to integrate themselves into faculties, departments, and instruction (Clyde & Lee, 2011).

Much literature is available about successfully embedding librarians into academic coursework (e.g., Abrizah et al., 2016; Brower, 2011; Pati & Majhi, 2019). A recurring issue for embedded librarians is that students often do not initially know what to make of a librarian presence in the classroom, and it takes time to establish a connection (Manus, 2009). Responsibilities for the embedded librarian vary from creating learning objects tailored to course assignments to regularly visiting classes throughout the term to offering one-on-one consultations (Coltrain, 2015). Successful embedding in the realm of IBL courses is still uncharted.

Embedded librarianship proves to have higher impact than one-shot sessions, as Tang and Tseng (2017) acknowledged: “A one-shot library instruction class can easily overwhelm a student with jam-packed information and is likely to only be beneficial for students working on course projects. Multiple library instruction interventions are necessary to enhance information literacy skills” (p. 478).

Furthermore, Heathcock (2015) found that students who utilized an embedded librarian, as well as the materials provided by the librarian for instruction purposes, performed better on their library research assignments, suggesting that the embedded librarian was useful in addressing student information needs.

Critical Information Literacy

Shumaker (2012) stated that the work of librarians must move beyond content and into pedagogy as the driving force for ongoing student interactions. Librarians teaching IL should aim to help students build critical awareness of the context and place of information in their academic work in addition to practical navigational skills (Drabinski, 2014; Elmborg, 2006). This pedagogical shift encourages students to develop more than just the skills to fulfill assignments; it helps move student development towards a more self-reflective, lifelong, and critical awareness of their information uses within social and other settings (Beilin, 2015). In addition, data from social learning studies demonstrate that within expanded learning networks, students are better able to “self-organize, share knowledge, promote strong leadership, encourage shadow networks and facilitate polycentric decision-making over multi-scales” (Phuong et al., 2017, p. 96).

Inquiry-based Learning

Educators have recognized the benefits of replacing passive, content-based instruction with active discovery-based learning, which better develops skills in creativity, critical thinking, and problem solving (Saavedra & Opfer, 2012). These skills also build naturally into the critical IL goals discussed above. IBL courses and other SoTL products have common goals well-served by a regularly available embedded librarian. Evidence supports IBL learning collaborations with IL instruction in primary and secondary education (e.g., Chu et al., 2011; Montiel-Overall & Grimes, 2013), but far less literature is available exploring these relationships in the post-secondary context.

Conversations and collaborations between SoTL scholars and librarians have been and will continue to be fruitful and mutually beneficial. As McClurg et al. (2019) noted, "sharing questions about student learning and ideas for improving activities and assignments can provide the basis for deeper discussions of SoTL, potential projects, levels of engagement, and workload capacity" (p. 10). Furthermore, collaboration between faculty members as instructors and embedded librarians as IL experts achieves common goals of student engagement and learning, IL development, and cross-institutional collaboration (Coltrain, 2015; Li, 2012). Li (2012) found many positive changes from pre-course assessment to post-course assessment, including a decrease in the number of students answering only some assessment questions as well as an increase in the number of students exhibiting confidence in their research abilities.

Data Generating Process

Librarian Meetings

The group of five librarians began to discuss their experiences during the course and met in the last week of Fall 2018 classes. They captured reflections and continued correspondence over the following months, primarily via email and shared documents. The final data (see Tables 1 and 2) were consolidated during a second meeting in the Winter 2019 term. Table 1 presents data corresponding to each librarian liaison area including paired instructor, course involvement, instruction, feedback, and workload implications. Table 2 includes instructional strategies that librarians gained from their experiences in the course for potential application in other instruction.

Shared Benefits of the Embedded Experience

LCR already had three librarians who collaborated as part of their work portfolio with academics and staff in the TI. When the lead from the TI and the librarian collaborator discussed the new UNIV 201 course offering, they began the process of recommending a librarian-teaching partner for each section. The three librarians already affiliated with the TI indicated interest to extend their collaboration with UNIV 201. The remaining two sections were filled by an open call sent to academic librarians in the LCR unit. Two additional librarians joined the team, making the teaching team five instructors and five embedded librarians: one pair for each of the five sections available (See Table 1).

The nature of the inquiry-based model meant that librarians did not work together to standardize material. While each section had the same topics, instructors delivered their courses in different ways, with different activities, and, in some cases, different guest speakers. Level of librarian participation was determined and recorded by the individual librarian and reported to their manager during their annual performance review (see Table 1 for the number of sessions librarians attended and the number of lectures they delivered). Reflection occurred in casual conversation in meeting rooms the following semester. Out of the five instructors who taught in the fall semester, only one returned to teach again. This was in part because the program encouraged new instructors in order to provide new voices and opportunities to others from across campus. We believe that this anticipated turnover is the reason that there wasn't an opportunity, either at the beginning or the end of the semester, for the five instructors and five librarians to gather as a group to discuss and strategize.

Table 1

Course Data

Librarian Liaison Area	*Instructor Discipline*	*# of Students in Section*	*Total # of course hours*	*# of course hours attended by librarian*	*# of course hours taught by librarian*	*Met with instructor prior to course?*	*Attended final course presentations?*	*Addition to workload (hours per week)*	*Student feedback? If so, when/how?*	*Involved in course since?*
Art, Architecture	Medicine	22	36	33	12	Yes	No	3-5	Positive feedback multiple times from instructor during and following course.	Yes
Engineering and Geosciences	Advertising and Design Thinking	24	36	36	6	Yes	Yes	3-5	Positive feedback during in-office consultations. Positive feedback from instructor.	No
Social Sciences	Social Work	23	36	33	6	Yes	Yes	3-5	Positive feedback from instructor verbally. Students were appreciative of in class and email assistance.	No
Social Sciences & Humanities	Sociology	24	36	24	3	Yes	No	3-5	Positive feedback from students during course. Positive feedback from instructor during weekly meetings.	No
Music, Dance, Drama, Foreign Languages, Linguistics	Organizational Learning and Development	22	36	36	6	Yes	No	3-5	Positive feedback from students during course. Positive feedback from instructor during weekly meetings.	Yes

With the variability that can come from five distinct course sections, instructors, librarians, and student groups, the librarian group found it reassuring and positive to share reflections and common themes from their experiences.

Four shared positive elements emerged from our embedded experiences: formal and informal instructional opportunities, positive impact on student perceptions, opportunities to teach higher order IL skills, and the use of innovative teaching strategies. Table 2 contains comments from the librarian group regarding their takeaways for each of these positive elements.

Instructional Opportunities

All five librarians had opportunities to give at least one scheduled presentation in their respective course section. The frequency of pre-scheduled librarian instruction during class varied from one to three times per semester (see Table 1), with all librarians experiencing many more ad hoc teaching opportunities, some of which were initiated by the instructor and some by the librarian. When they were not actively teaching, librarians would support students by participating in activities, exchanging ideas, or providing prompts. Often, students would ask librarians to provide clarification on assignments or assist with groupwork dynamics. The inquiry-based model allowed librarians to spend time supporting students individually and in groups. These informal exchanges between librarians and students were reported as valuable by both groups and led to our second positive element.

Positive Student Perceptions

A second positive element was the ability to develop stronger rapport with students than is typically achieved in library instruction. Students expressed surprise at aspects of their work that librarians or the library could support. Opportunities to promote library services and spaces such as interlibrary loan, maker-spaces, virtual reality, audiovisual editing suites, and study rooms in addition to traditional content such as searching, citing, and collections displayed the broad range of skill sets and resources available to students. One librarian found that sharing these services and skills at the point when they were most useful to students' work boosted the impression of the library's relevance to students. The literature has shown that repeated librarian-student interactions during a course build stronger relationships and student IL skills (e.g., Hoffman et al., 2017). Kim and Schumaker (2015) shared student feedback from a first-year course with single IL sessions: "It was effective, however I think there should be more than one library session in class" (p. 453); "Our librarian…only reached out to us one time…It was a good library session but often [sic] that we never heard of him again. We need more involvement from him" (p. 453).

Information Literacy Skill Building

A third positive element of the embedded experience in an inquiry-based course was the possibility to focus more on critical information and digital literacy skills than

traditional library content. The ACRL Framework for Information Literacy's frame "Research as Inquiry" provides a natural overlap with UNIV 201's curricular goals. The librarians in UNIV 201 facilitated topics such as determining evidence quality, bias, and critical thinking about information. All five librarians found that the additional time enhanced engagement with students around the information challenges of today and that librarians had an impact on students and their academic work. As inquiry is such a present theme of UNIV 201, the librarians were able to easily build from this to IL content. Although no formal assessment of student engagement was conducted in this case, informal feedback from students, instructors and librarians indicated positive impact from these interactions and librarian contributions to the course sections (see Table 1).

Innovative Teaching Strategies

Being involved in an innovative course fostered our own creative thinking in making IL instruction as dynamic and relevant as possible to IBL (see Table 2). Examples of activities used to teach IL concepts in UNIV 201 included:

- Using a discussion board in the Learning Management System (e.g. D2L, Canvas) for students to post sources from a searching activity and following up later with students on how to assess the quality of the source chosen. This activity continued the learning after class time and engaged with students in a secondary venue.

- Creating a LibGuide specific to UNIV 201 with links to the textbook, selected books, and pages on information gathering, critical thinking, attribution, project research strategies and inspirations, and classroom activities

- Leading an experiential learning activity and classroom discussion on source credibility

- Using relationships built in class as an opportunity to check in with students on their project progress during encounters in the library or elsewhere on campus

Table 2

Embedded Librarians' Comments about their Instructional Takeaways

Type of Benefit	Librarians' Takeaways for Use in Future Instruction
Instructional opportunities	• "Keeping in regular contact with instructors helps the librarian to find good timing in the semester to join and present in classes." • "Reciprocity is very important for intensive participation in a course." • "Understanding how and when instructors implement resources like guest speakers, films, and activities."
Positive student "perceptions	• "It is most important to get to know students and be able to understand their needs in regards to the course and their career as a student." • "Getting to know students is beneficial (you never know who will take you up on librarian support)." • "Approachability and openness are key to achieve the best possible outcome. In this manner, students and instructors develop a more positive, less obscure picture of the library and its services."
IL skill building	• "Try to motivate students to get excited about research as early as possible in their degrees."
Innovative teaching strategies	• "Use of discussion-focused activities as a means of introducing session content during a library session has been helpful in generating student interest and engagement as well as instructor participation." • "Just-in-time versus just-in-case should be evaluated." • "Working with student groups as they progressed throughout their projects made me think about more creative approaches for my own teaching."

Shared Challenges of the Embedded Experience

Because every section of the UNIV 201 course was unique, we identified two challenges librarians faced collectively. The first challenge may be difficult to overcome as it concerns balancing impact and sustainability of librarian involvement in the course, especially as the course grows and evolves. Second, all embedded librarians experienced varying hurdles due to a lack of clarity around course roles and responsibilities. This second issue is likely a result of the continual emergent nature of the course, but it is something instructors, librarians, and administrators contemplating such a partnership should keep in mind.

Sustainability

Librarians who were not able to attend every lecture reported feeling less integrated into the course and the group dynamics of their assigned section. Of those who did not frequently attend lecture time, missed content and missed opportunities for developing relationships were the top two reasons for feeling less connected to the course material. However, for some librarians involved, the course schedule did not work well with their other professional obligations; there was no expectation that librarians attend every class.

Students were able to build more robust relationships with librarians in sections where the librarian was able to participate in every class: librarians who attended the majority of the classes (see Table 1) self-reported more requests for assistance in and outside of class time. Librarians also had more opportunities for IL instruction and other library presentations if they were able to commit more fully to the course. While these findings only represent librarians' perceived impact, they illuminate an avenue for future research.

Role Definition

The second challenge librarians faced relates to role definition. While the librarians were introduced to their respective sections and had an opportunity to deliver instruction, their role was not clearly identified to the students. It was not clear whether the librarian was an instructor, a teaching assistant, a guest speaker or, in one humorous moment (at the end of term, no less!), a student in the course. This fuzziness was exacerbated with the sporadic presence of peer mentors in some sections. These were returning students from previous UNIV 201 cohorts who provided mentorship.

It is not necessarily bad practice to break down unnecessary hierarchies and blur roles; it can more meaningfully integrate different professional practices. Shulman (2005) argued that such cross-practice learning can be beneficial for the improvement of didactic methods. Shulman referred to such practices as professional signatures and explained that

> [s]ince individual professions adapt to their own signatures, which, however effective, are prone to inertia, we can learn a great deal by examining the signature pedagogies of a variety of professions and asking how they might improve teaching and learning in professions for which they are not now signatures. (p. 58)

Fixing roles within such a dynamic learning environment is not only difficult but also not necessarily of the greatest utility.

Nevertheless, because the various professional signatures ought to influence one another, a clearer communication of the various support structures available to students could both help students better manage their expectations of individuals involved in the course and benefit those facilitating the course through the sort of inter-professional learning Shulman (2005) advocated. It is possible that the vagueness around classroom roles came from the lack of clarity on the level of collaboration between instructors and librarians. Chick et al. (2019) suggested four models of librarian engagement in products of SoTL: consultant, developer, partner, and scholar. Using this framework to determine an appropriate level of engagement for UNIV 201 could dissipate some of the role confusion and build clarity for librarians, instructors, and students.

The vagueness surrounding roles in the course sometimes translated to less than optimal librarian-instructor interactions. Instructors had different perceptions of librarian roles and thus different expectations of librarian responsibilities. This resulted in varying levels of engagement with student work, such as whether librarians were responsible for the assessment of student work and blurred salient functional and administrative boundaries. Confusion around participation extended to course planning: librarians faced instructor requests for last-minute presentations and impromptu lectures, putting undue stress on the management of librarians' other time commitments. The lack of role definition may have resulted in librarians being expected to perform the roles of teaching assistants or guest instructors.

The final challenge related to role confusion was that librarian roles, and thus, by extension, library content, was not clearly integrated into the course syllabus. Evaluative activities would have benefitted from integration of librarian-led content, such as searching strategies, source evaluation, evidence quality, and bias, as components of assessment. Some instructors wanted their students to explore the academic literature while others were more interested in students engaging with social media, news outlets, blogs, and other non-scholarly information sources.

The uncertainty of librarians' roles is important to identify as the UNIV 201 course continually evolves. According to the SoTL literature, "[i]n the Learning Paradigm, the key structure that provides the leverage to change the rest is a system for requiring the specification of learning outcomes and their assessment through processes external to instruction" (Barr & Tagg, 1995, p. 25). Barr & Tagg (1995) argued that the more the teaching outcomes are investigated, "the more rapidly they will change" (p. 25). Our collective observations serve as one such investigatory process of evaluation of

curriculum outcomes and their assessment. Upon careful reflection, research skills and other library and information competencies should be a central component of the learning outcomes for an IBL course like UNIV 201. Earlier librarian involvement in planning and setting outcomes for the course could create a more consistent and complete integration of IL skill building for students.

Because “good practice in SoTL requires that both the process and the products of inquiry are public so that colleagues can critique and use the work” (Felten, 2013, p. 124), the authors hope that the challenges articulated will benefit both the continuing evolution of UNIV 201 and administrators, instructors, and librarians at other institutions embarking on similar collaborations. The authors also think that our collective experiences place us in a unique position to propose solutions to increase optimal outcomes for these collaborations in the future.

Moving Forward into the Future

Sustainability & Scalability

Librarian involvement worked in the context of the current UNIV 201 environment. With only five course sections, finding five librarians who could attend the majority of classes was possible. If UNIV 201 were expanded, there would need to be a discussion of how librarian involvement could be accomplished or sustained.

Clarity of Role Definition

As librarians continue to collaborate on inquiry-based courses, there should be more opportunities for librarian involvement in the planning process, the class assignments, and post-course assessment. Integrating librarian input before the course would likely increase IL skills for students throughout the course and would optimize librarians’ time commitments during class. Librarians have many other commitments and responsibilities. Determining optimal involvement in UNIV 201 would be beneficial to all. Discussing and identifying an ideal model of engagement (e.g., librarian as consultant, developer, partner, or scholar) for this collaboration would also likely build clarity for administrators, instructional teams, and students (Chick et al., 2019).

UNIV 201 is unique in that it was developed to be an interdisciplinary, inquiry-based course. Although its openness had positive impacts, it also led to some faculty and librarian discomfort with the lack of structure. Pritchard (2010) explained how librarians could increase understanding of their roles: “it is not enough to simply view ourselves as professional colleagues with important knowledge and expertise to contribute. We need to be able to define it for ourselves and clearly communicate it to faculty” (p. 388). Librarians should continue to advocate for inclusion in planning, syllabus and assignment design, and assessment for IBL courses. This early involvement would maximize student IL skill outcomes and optimize librarian-instructor collaborations.

Future Opportunities

As we look to the future of interdisciplinary collaboration and "librarians as partners" (Chick et al., 2019) in UNIV 201, the authors have the opportunity to debrief as a unit and proceed together. The librarians involved intend to initiate librarian-instructor collaboration on UNIV 201 in the future, but we cannot assume that future directions for the course will include librarians, embedded or otherwise. There are many ways that librarians can participate, and individuals on the librarian team have the academic freedom to determine whether the level of creativity, time, and labour are conducive to schedules and preferences. The following are potential avenues for continuing to make the librarian aspect of courses like UNIV 201 meaningful and productive for all.

Inquiry-Based Learning (IBL) Librarian Sessions

One approach could be to model instruction purposefully and intentionally through an IBL model. The start of the 2018 term was an opportunity to teach IL in a new way, but the librarians did not meet to create an intentional IBL plan. A unique aspect of the course is its enrollment limitation to students with 18 course credits or less, allowing junior students a departure from the standard and expected "sage on the stage" lecture (King, 1993, p. 30). Unless a student enters university from a high school with a well-funded library, we hypothesize that a large percentage of students do not understand what the academic library is, what it contains, who librarians are, or how students are supposed to use the resources and, importantly, why.

In an inquiry-based setting where students get to drive their learning, there can be pressure on cross-disciplinary teams to ensure that course content is translated effectively. As Carmichael (2012) noted,

> [t]he teachers involved in the project characterised the experience of first year undergraduates in terms of "encounters" with complex ideas and the development of "reflexivity" as the ability to reflect, not just on others' assumptions and preconceptions, but to simultaneously use them to reflect on one's own. These encounters often involved engaging with student misconceptions about the nature of the discipline, which few had previously studied. (p. 36)

While the inquiry-based model allowed for freedom and experimentation, some librarians perceived that a lack of meaningful grounding meant students had difficulty asking sophisticated questions about information and evidence gathering. For example, if a librarian was allotted two hours of active lecture time in UNIV 201, was time spent on classical teaching of the scholarly databases or on information concepts? If a student experienced problems with either, the IBL approach would be to encourage their exploration.

Students' final presentations suggested that they did not seek additional information about IL skills that were not discussed in class. This is not to suggest that students

didn't want to learn—some groups demonstrated learning once they had access to it. Many students accepted librarians' offers for help via email, office hours, or referrals to the data or visualization centre. Assuming students will independently figure out which scholarly databases are available to them may not be realistic, and some navigation, repetition, and even point-and-click demonstration is still a good approach. Given that generating creative and innovative ideas is one of the course learning outcomes, the librarian content should be listed as a UNIV 201 learning objective and assessed as such so that students have incentive to learn and grow their information skills in an inquisitive way. Whether librarians elected to apply an intentional IBL model to their own instruction or not was not standardized across all five sections.

Lesson Study

As discussed, the authors had varying levels of integration with their section instructors. One-shot library instruction is a frequent occurrence in the academic setting and has varying success rates for skill development, knowledge transfer, and relationship building with students and instructors alike. One-shot sessions often stifle the opportunity to incorporate active learning techniques and can restrict creativity if there are limitations on resources such as time, space, and technology (Watson et al., 2013). In UNIV 201, where librarians have the freedom to extend instruction beyond a one-shot, the authors have explored the possibility of engaging in a lesson study approach to assess student learning of IL concepts. Lesson study is a Japanese approach to encourage "teaching for understanding" instead of "teaching as telling" (Watson et al., 2013). The librarians could plan initial lessons, observe each other's instruction, and go through a review and revision process to learn more deeply about information skills development in UNIV 201. A lesson study requires more resources of the librarian team, such as time, organization, and preparation, but it could prove to be a valuable exercise to discover more about teaching styles and student learning.

Threshold Concepts

Threshold concepts, or crucial core concepts that a student needs to understand to become skilled in a field of study, were first developed by Meyer and Land (2005). Often "unspoken or unrecognized by expert practitioners" (Townsend et al., 2016, p. 23), these processes and ideas are transformative, integrative, irreversible, bounded, and troublesome (Meyer & Land, 2005). In its Framework for Information Literacy for Higher Education, the Association of College and Research Libraries (ACRL, 2015) described these "passageways or portals to enlarged understanding … and practicing within th[e] discipline" (p. 7). While the Framework does not overtly outline what the concepts are, because IL is both a "disciplinary and a transdisciplinary learning agenda" (ACRL, 2015, p. 27), it encourages librarians to consider context in framing sessions for students, regardless of discipline. In the future, deeper conversations with the instructional team from all sections of UNIV 201 should standardize librarians' instruction across sections to encourage students to tackle IL threshold concepts that are pertinent to inquiry-based courses. In discussion among the authors, we determined that most librarians taught these concepts, but the extent and the process by which we translated concepts was

not consistent. Sameness in style or even content sequence is not necessarily the goal. However, a common set of objectives and ways of measuring student learning would elevate the librarians' content to better integrate with that of the instructor group; less "choose your own adventure" and more "yellow brick road" may be a way forward with a librarian team of this size. We felt that the following suggestions from the Framework are of particular pertinence to the overall goals of an inquiry-based course (ACRL, 2015, p. 27):

- Partner with your IT department and librarians to develop new kinds of multimedia assignments for courses. — What kinds of workshops and other services should be available for students involved in multimedia design and production?

- Help students view themselves as information producers, individually and collaboratively. — In your program, how do students interact with, evaluate, produce, and share information in various formats and modes?

- Consider the knowledge practices and dispositions in each information literacy frame for possible integration into your own courses and academic program. — How might you and a librarian design learning experiences and assignments that will encourage students to assess their own attitudes, strengths/weaknesses, and knowledge gaps related to information?

Focusing on intentional teaching and learning approaches makes us optimistic about the future of these collaborations and contributions to IBL opportunities.

Assessment of Optimal Librarian Involvement

As we have previously suggested, future research could explore a comparison of inquiry-based course sections with varying librarian involvement. Measuring IL skill building in students and comparing to other course sections would help to illuminate the most effective level of librarian collaboration.

Conclusion

There is opportunity for librarians to contribute as educators in an inquiry-based course or project. Implementing the ACRL Framework offers space for librarians to engage with learners who are at various levels of IL development. Inquiry-based courses also offer a student-driven, reflective educational environment, which generates an essential awareness promoted by critical IL literature. The accessibility that students have with their embedded librarian can foster a working relationship in a learning space built on collaboration, trust, and collegiality.

Collaborating with a campus teaching and learning department, as well as with instructors in IBL, continues to be a rewarding, impactful, and interesting experience for the librarian team. It has allowed the librarians to connect with new undergraduate

students and contribute to an awareness of the research process and necessary foundational IL skills. The breadth of experiences among the five librarians showcases shared benefits including instructional opportunities, positive student perceptions, IL skill development, and innovative teaching.

The UNIV 201 collaboration has involved complications, primarily sustainability and role definition, which are rooted mainly in course organization with multiple sections running simultaneously. The ability to participate as teaching partners, content creators, assessors, and student mentors has allowed our team to integrate experiential and innovative course programming. More meaningful course content development with an intentional foundation in IBL will establish the IL threshold concepts in which the librarian team is able to engage. Future collaborative opportunities will continue to be fruitful, and future research could quantitatively explore librarian impact in IBL programming.

As we continue to learn, revise, and move forward together, our incremental and reflective approach will produce an ever stronger inquiry-based course offering as well as insights into enhancing and building campus instructional initiatives and partnerships.

References

Abrizah, A., Inuwa, S., & Afiqah-Izzati, N. (2016). Systematic literature review informing LIS professionals on embedding librarianship roles. *The Journal of Academic Librarianship, 42*(6), 636-643.

Association of College and Research Libraries. (2015). *Framework for information literacy for higher education.*

Barr, R., & Tagg, J. (1995). From teaching to learning: A new paradigm for undergraduate education. *Change*, *27*(6), 12-25.

Bass, R. (1999). The scholarship of teaching: What's the problem? *Inventio: Creative Thinking About Learning and Teaching*, *1*(1), 1-10.

Beilin, I. (2015, February 25). Beyond the threshold: Conformity, resistance, and the ACRL Information Literacy Framework for Higher Education. *In the Library with the Lead Pipe.*

Bowles-Terry, M., & Donovan, C. (2016). Serving notice on the one-shot: Changing roles for instruction librarians, *International Information & Library Review*, *48*(2), 137-142.

Brower, M. (2011). A recent history of embedded librarianship: Collaboration and partnership building with academics in learning and research environments. In C. Kvenild & K. Calkins (Eds.), *Embedded librarians: Moving beyond one-shot instruction*. Association of College and Research Libraries.

Carmichael, P. (2012). Tribes, territories and threshold concepts: Educational materialisms at work in higher education. *Educational Philosophy and Theory*, *44*(Suppl. 1), 31-42.

Chick, N., McClurg, C., & MacMillan, M. (2019, January 24-25). Librarians in SoTL: Four models of engagement [Conference presentation abstract]. *SoTL Commons Conference*, Savannah, GA, United States.

Chu, S, Tse, S.K., & Chow, K. (2011). Using collaborative teaching and inquiry project-based learning to help primary school students develop information literacy and information skills. *Library and Information Science Research, 33*(2), 132-143.

Clyde, J., & Lee, J. (2011). Embedded reference to embedded librarianship: 6 years at the University of Calgary. *Journal of Library Administration, 51*(4), 389-402.

Coltrain, M. (2015). Collaboration: Rethinking roles and strengthening relationships. *Community & Junior College Libraries, 21*(1-2), 37-40.

Dewey, B. I. (2004). The embedded librarian: Strategic campus collaborations. *Resource Sharing & Information Networks, 17*(1-2), 5–17.

Drabinski, E. (2014). Toward a *kairos* of library instruction. *The Journal of Academic Librarianship, 40*(5), 480-485.

Drewes, K., & Hoffman, N. (2010). Academic embedded librarianship: An introduction. *Public Services Quarterly, 6*(2-3), 75-82.

Elmborg, J. (2006). Critical Information Literacy: Implications for Instructional Practice. *The Journal of Academic Librarianship, 32*(2), 192-199.

Felten, P. (2013). Principles of good practice in SoTL. *Teaching & Learning Inquiry*, *1*(1), 121-125.

Heathcock, K. (2015). Embedded librarians: Just-in-time or just-in-case? A research study. *Journal of Library & Information Services in Distance Learning, 9*(1-2), 1-16.

Hoffman, N., Beatty, S., Feng. P., & Lee, J. (2017). Teaching research skills through embedded librarianship. *Reference Services Review, 45*(2), 211-226.

Justice, C., Rice, J., Roy, D., Hudspeth, B., & Jenkins, H. (2009). Inquiry-based learning in higher education: Administrators' perspectives on integrating inquiry pedagogy into the curriculum. *Higher Education, 58*(6), 841-855.

Kim, S., & Shumaker, D. (2015). Student, librarian, and instructor perceptions of information literacy instruction and skills in a first year experience program: A case study. *The Journal of Academic Librarianship, 41*(4), 449-456.

King, A. (1993). From sage on the stage to guide on the side. *College Teaching*, *41*(1), 30-35.

Li, J. (2012). Serving as an educator: A southern case in embedded librarianship. *Journal of Business & Finance Librarianship, 17*(2), 133-152.

Manus, S. (2009). Librarian in the classroom: An embedded approach to music information literacy for first-year undergraduates. *Notes, 66*(2), 249-261.

McClurg, C., MacMillan, M., & Chick, N. (2019). Visions of the possible: Engaging with librarians in the Scholarship of Teaching and Learning. *Teaching & Learning Inquiry, 7*(2), 3-13.

Mery, Y., Newby, J., & Peng, K. (2012). Why one-shot information literacy sessions are not the future of instruction: A case for online credit courses. *College & Research Libraries, 73*(4), 366-377.

Meyer, J. H. F., & Land, R. (2005). Threshold concepts and troublesome knowledge: Epistemological considerations and a conceptual framework for teaching and learning. *Higher Education*, *49*(3), 373-388.

Montiel-Overall, P. & Grimes, K. (2013). Teachers and librarians collaborating on inquiry-based science instruction: A longitudinal study. *Library and Information Science Research, 35(*1), 41-53.

Pati, B., & Majhi, S. (2019). Pragmatic implications of embedded librarianship in academics: A review of eminent literatures. *Library Hi Tech News, 36*(2), 11-16.

Phuong, L. T. H., Biesbroek, G. R., & Wals, A. (2017). The interplay between social learning and adaptive capacity in climate change adaptation: A systematic review. *NJAS - Wageningen Journal of Life Sciences, 82*, 1-9.

Pritchard, P. A. (2010). The embedded science librarian: Partner in curriculum design and delivery. *Journal of Library Administration*, *50*(4), 373-396.

Saavedra, A. R., & Opfer, V. D. (2012). Learning 21st-century skills requires 21st-century teaching. *Phi Delta Kappan, 94*(2), 8–13.

Shulman, L. S. (2005). Signature pedagogies in the professions. *Daedalus*, *134*(3), 52-59.

Shumaker, D. (2012). *The Embedded librarian: Innovative strategies for taking knowledge where it's needed.* Information Today.

Tang, Y., & Tseng, H. (2017). Undergraduate student information self-efficacy and library intervention. *Library Review, 66*(6-7), 468-481.

Townsend, L., Hofer, A., Lin Hanick, S., & Brunetti, K. (2016). Identifying threshold concepts for information literacy: A Delphi study. *Communications in Information Literacy*, *10*(1), 23-49.

Watson, S., Rex, C., Markgraf, J., Kishel, H., Jennings, E., & Hinnant, K. (2013). Revising the "one-shot" through lesson study: Collaborating with writing faculty to rebuild a library instruction session. *College & Research Libraries*, *74*(4), 381-398.