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Connecting theory to practice: Using the Community of Inquiry theoretical framework to examine library instruction

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Abstract

This design-based research study of library instruction was developed using the Community of Inquiry theoretical framework. Three different instructional approaches were developed and evaluated as part of this study: the one-shot session approach, the partially embedded librarian approach and the fully embedded librarian approach. Surveys, interviews and journaling were used to gather data from faculty, undergraduate students and the researcher–librarian about their experiences. This research study is unique given the combined use of design-based research methodology and the Community of Inquiry theoretical framework to collaboratively design and evaluate library instruction.

Keywords

ACRL Framework; collaboration; Community of Inquiry theoretical framework; design-based research; embedded librarian; information literacy

1. Introduction

Designs for teaching and learning in higher education are shifting from a focus on individualised learning (Warner, 2016) towards diverse designs that create opportunities for collaboration and deep learning (learning for transfer) (Akyol & Garrison, 2011). At the same time, library instruction in higher education is shifting from a focus on demonstration in the library (Mikkelsen & McMunn-Tetangco, 2016) to designs that engage students ‘to be active participants in their learning by promoting higher order thinking’ (p.1). Library instruction is now being integrated into courses by librarians and faculty members who work collaboratively to develop the curriculum (Simons, 2017). The Community of Inquiry (CoI) theoretical framework focuses on creating learning communities based on deep learning (Mehta, Makani-Lim, Rajan, & Easter, 2017) and knowledge construction (Shea & Bidjerano, 2010); this emphasis can guide the design of library instruction and course-based teaching and learning in higher education to create conditions conducive to greater collaboration and learning for transfer (Bailey, 2017; Melgosa, 2018; Rapchak, 2017).

Academic librarians are beginning to take notice of the CoI theoretical framework as it relates to library instruction with regards to the development and delivery of library instruction (Bailey, 2017; Melgosa, 2018; Rapchak, 2017). In this paper, we discuss how the CoI theoretical framework can be used as a lens to better understand the role of librarians in course-based teaching, coupled with a view to improve collaborations between faculty and librarians in order to integrate and evaluate effective library instruction across various disciplines.

1.1 Research questions

Two research questions framed this study: (a) How can the delivery of library instruction influence students' scholarly writing in higher education; (b) How can the Community of Inquiry theoretical framework inform the design of library instruction? This paper focuses on the exploration of the first research question and the potential for future research and implementation of the Col theoretical framework in the design and delivery of library instruction.

2. Literature Review

2.1 Collaboration between librarians and writing instructors

Writing instructors' and librarians' collaboration efforts towards improving student learning of the research and writing process date back to 2003 (Norgaard & Sinkinson, 2017). One example of this collaborative effort comes through partnerships to integrate information literacy (IL) into courses (Black, Crest, & Volland, 2001; D'Angelo & Maid, 2004; Davidson & Crateau, 1998; Holliday & Fagerheim, 2006; O'Connor, Bowles-Terry, & Holliday, 2010; Shonrock, 2006). Another example of collaboration comes from designing library instruction to emphasise that the research process and writing process are connected (Artman, Friscaro-Pawlowski, & Monge, 2010; Elmborg & Hook, 2005; Gruber, Knefel, & Waelchli, 2008; Jacobs & Jacobs, 2009; Mazziotti & Grettano, 2011; Veach, 2012).

Librarians and writing instructors have attempted to integrate library instruction into first-year writing courses in a variety of ways: the 'one shot' library visit (Gavin, 1995; Jacobs & Jacobs, 2009), a program-wide IL component (Holliday & Fagerheim, 2006; Jacobson & Mackey, 2007), embedded librarians (Bensen, Woetzel, Wu & Hashmi, 2017; Deitering & Jameson, 2008; Kesselman & Watstein, 2009; Samson & Granath, 2004), and team-taught courses (Alvarez & Dimmock, 2007; Jacobson & Mackey, 2007; Peary & Ernack, 2004). It seems that there is a dearth of research conducted after 2011 on collaborations between librarians and first-year writing faculty on integrating library instruction into courses (Bailey, 2017; Gocsik, Braunstein, & Tobery, 2017; Scheidt, Carpenter, Middleton, & Shields, 2015; Wojahn et al., 2017). With the introduction of the Association of College and Research Libraries (ACRL) IL Framework, more librarians are becoming aware of the need to promote and assess students' metacognition (thinking of one's own thinking) as it relates to the process of research and writing (Bailey, 2017; Negretti, 2012; Wojahn et al., 2017). The recent introduction of the ACRL Framework is discussed further in the next section.

2.2 Shared theoretical concepts of IL (research) and writing

Librarians are being challenged to create learning environments that provide students with opportunities to engage in metacognition, which can be defined as 'the monitoring of one's thinking and learning processes' (Houtman, 2019, p.7). The ACRL *Framework* provides six key themes with associated knowledge practices and dispositions to guide a librarian's way of 'thinking and acting related to information literacy' (Houtman, 2019, p.7). According to the ACRL (2015):

the *Framework*... is called a framework intentionally because it is based on a cluster of interconnected core concepts, with flexible options for implementation, rather than on a set of standards or learning outcomes, or any prescriptive enumeration of skills. (p.2).

The *Framework* was developed to facilitate collaboration between librarians and instructors to address the greater role and responsibility placed on students in 'creating new knowledge, [in order to anticipate] the contours and the changing dynamics of the world of information, [and] in using information, data, and scholarship ethically' (ACRL, 2015, p.2). It was developed in a manner that can support librarians and instructors in collaboration efforts to design instruction sessions, assignments and assessments together (ACRL, 2015).

Recently, the fields of both Library Science and Rhetoric and Composition have drafted frameworks that were developed through the use of threshold concepts (ACRL, 2015; Writing Program Administrators, 2014). These two frameworks bridge disciplinary boundaries and offer a renewed approach that aids cross-disciplinary writing instructors and librarians in collaboration, with the goal of helping students understand the combined process of research and writing (D'Angelo, Jamieson, Maid, & Walker, 2017). Alder-Kassner and Wardle (2015) define threshold concepts as 'concepts critical for continued learning and participation in an area or within a community of practice' (p.2). In addition to the two frameworks, there is a book called *Naming What We Know: Threshold Concepts of Writing Studies* that is used in librarian/writing instructor collaborations designed to integrate library instruction into course-based teaching (Anderson, Blalock, Louis, & Murphy, 2018; Bensen, Woetzel, Wu, & Hashami, 2017; Johnson & McCracken, 2016; Maid & D'Angelo, 2017).

With shared concepts, there is a need to create ways in which writing instructors and librarians can come together to discuss and design integrated instruction that supports students with the process of research and writing (Kissel et al., 2017). Recent research suggests two different methods for creating such communities among writing instructors and librarians: the Community of Practice (CoP) model (Kissel et al., 2017) and the Community of Inquiry (CoI) theoretical framework (Melgosa, 2018). A CoP is defined as a 'community of individuals who are engaged in informal relationships and committed to intellectual engagement in order to create and sustain an ongoing domain or area of interest or expertise' (Melgosa, 2018, p.41). Melgosa (2018) concludes that the CoI theoretical framework is a better fit for this type of collaborative work. CoP appeared to require significant amount of time to implement which is not available to librarians in their jobs (Melgosa, 2018). Chosen for this study given the emphasis on collaboration, the CoI theoretical framework will be discussed in more detail in the next section as we describe how it was used to inform the design and evaluation of library instruction integrated into first-year writing courses to help students understand the process of research and writing.

2.3 Connecting the Community of Inquiry theoretical framework to first-year writing courses and library instruction

The CoI theoretical framework was developed to 'provide conceptual order and a tool for the use of computer mediated communication and computer conferencing in supporting an educational experience' (Garrison, Anderson, & Archer, 2000, p.87). A primary idea in the CoI theoretical framework is that an educational experience is embedded in a Community of Inquiry (Garrison et al., 2000). Garrison et al. (2000) suggest that the Community of Inquiry is comprised of teachers and students as key participants. We suggest that the librarian can also be included in this Community of Inquiry, especially as inquiry relates to research and scholarly writing. According to Garrison (2016) 'this framework represents a collaborative approach to inquiry that fuses personal reflection and shared discourse for a deep and meaningful learning experience' (p.53).

The CoI theoretical framework is comprised of three elements: teaching, social and cognitive presences (Garrison et al., 2000, p.87). Teaching presence is the design, facilitation and direction of cognitive and social processes for the purpose of realising personally meaningful and educationally worthwhile learning outcomes (Anderson, Rourke, Garrison, & Archer, 2001). Social presence describes the ability to form interpersonal connections and generate meaningful communication within the learning environment via self-expression and shared purpose among the members of a community (Garrison, 2009). Cognitive presence is the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse (Garrison, Anderson, & Archer, 2001). Rapchak (2017) contends that 'creating an online learning environment that generates these three presences, according to the model, will allow learners to become engaged in the process of critical inquiry' (p.2).

Librarians have recently begun to explore the use of the Col theoretical framework as it relates to library instruction (Bailey, 2017; Rapchak, 2017). The Col theoretical framework allows instructors to develop a technology-enhanced learning environment for reflection, discussion and the creation of knowledge (Garrison, 2011; Naber & Wyatt, 2014; Swartz, 2017). Rapchak (2017) contends that using the Col theoretical framework allows instructors to ‘focus on the full learning experience for students that allows them to employ higher-order thinking, to interact with their peers, and to receive guidance from the instructor’ (p.7).

As in library instruction, writing instructors have also only recently begun to explore the potential uses of the Col theoretical framework (Kim, 2016). Much of the work that has been done has focused on specific presences within the Col theoretical framework as these relate to first-year writing courses: social presence (Cunningham, 2015; Lomicka & Lored, 2012), teaching presence (Docker, 2016; Grigoryan, 2017) and cognitive presence (Comer, Clark, & Canelas, 2014). Other studies look at all three presences in relation to providing online feedback (Cox, Black, Heney, & Keith, 2015; Yang, 2016). More recent works are beginning to examine the potential uses of the Col theoretical framework in designing and evaluating first-year writing courses (Hilliard & Stewart, 2019; Stewart, 2017; Stewart, 2018). Stewart (2017) and Hilliard and Stewart (2019) focus on the design and assessment of the creation of a community of inquiry within a blended first-year writing course. A blended learning environment may be defined as ‘the addition of online resources and activities in a 100% face-to-face course to a course in which up to 70% of ‘seat time’ is replaced by online activities’ (Hilliard & Stewart, 2019). For the purposes of this discussion, ‘blended’ refers to the addition of online resources and activities in a 100% face-to-face course.

Baer (2016) suggests that with the increase of active and constructivist pedagogical approaches to learning in higher education, an opportunity exists for librarians and first-year writing instructors to collaborate, supporting the teaching of research and writing processes across various disciplines. In this study, we argue that librarians and writing instructors can use the Col theoretical framework to design library instruction integrated into first-year writing courses, thus building a community of inquiry to help students understand the interconnected nature of research and writing. Further, we contend that design-based research is an appropriate methodology for designing, implementing and evaluating collaboratively designed library instruction.

3. Exploratory design-based research study

3.1 Rationale

Using a design-based research approach, the research team (librarian and writing instructors) developed, implemented and evaluated three different designs of library instruction in an undergraduate writing course to determine which would best influence students’ scholarly writing in higher education. These were the one-shot session, the partially embedded librarian approach and the fully embedded librarian approach. Research suggests the best way to develop library instruction is in collaboration with the instructors who teach students how to produce scholarly writing. A design-based research approach was chosen for this study because it focuses on collaborations between researchers and practitioners to develop innovations that solve practical problems, which also informs theory and practice (Barab, 2014; McKenney & Reeves, 2012, p.8). Design-based research offers a methodological approach to iteratively refine and evaluate library instruction methods in the classroom to determine how librarians can best support student learning in relation to assignments given across disciplines. Barab (2014) suggests that design-based research is ‘used to study learning in environments that are designed and systematically changed by the researcher’ (p.151). This study was designed using McKenney and Reeves’ (2012) three-phase approach: (1) analysis and exploration; (2) design and construction; (3) evaluation and reflection.

3.2 Research design

Design-based research involves designing, implementing and evaluating innovations in authentic and dynamic learning environments (Barab, 2014). Collaboration between practitioners and researchers is key to the success of a design-based research study (Jacobsen, 2014). Design-based research consists of the following characteristics:

- The central goals of designing learning environments and developing theories or ‘proto-theories’ of learning are intertwined.
- Development and evaluation take place through continuous cycles of design, enactments, analysis and redesign.
- Research on designs must lead to sharable theories that help communicate relevant implications to practitioners and other educational designers.
- Research accounts for how designs function in authentic settings.
- Development of such accounts relies on methods that can document and connect processes of enactment to outcomes of interest. (Design-Based Research Collective, 2003, p.5)

As depicted in Figure 1, this study included the macro, meso and micro cycles normally seen in design-based research (McKenney & Reeves, 2012). The entire process and all cycles of the research study are referred to as the macro study. The analysis/exploration phase allows a research team time to ‘shape a better understanding of the problem to be addressed’ (McKenney & Reeves, 2012, p.85). During the design and construction phase, the research team explores the design of ‘potential solutions’ and then finally the design of the solution itself. At times, this phase has the potential to lead the research team back into the analysis and exploration phase which happened in this study. The final phase is the evaluation and reflection phase, in which the research team analyses the results and develops implications for theory and practice. These three phases make up the micro cycles of a research study. The meso cycle consists of more than one phase of a research study but not a complete macro cycle. The macro cycle of this research study consisted of three meso cycles: information gathering, iteration 1, and iteration 2. The first meso cycle of information gathering consisted of two micro cycles: analysis/exploration and design/construction. The second meso cycle, which consisted of Iteration 1, had the same two micro cycles as the first meso cycle. The third meso cycle differed in that it included the final phase of evaluation/reflection. The following figure is a pictorial representation of the different cycles in the research study, including the length of each cycle.

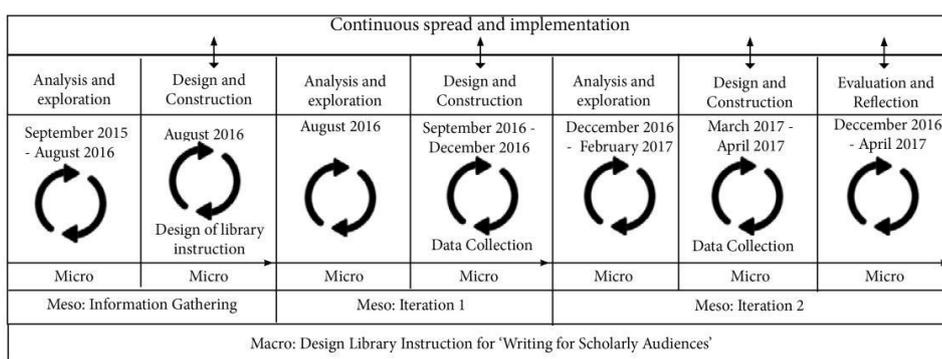


Figure 1: Cycles of the research study

3.3 Background

This study was conducted at a private four-year baccalaureate liberal arts and science college in the mid-west region of the United States. The primary focus at this college was undergraduate programs. The school consisted of 800 full-time equivalent students and 68 teaching instructors. The library staff was small: two librarians and two paraprofessionals. The

librarians shared instruction and research consultation duties. Instruction was split by subjects and one librarian was responsible for library instruction in all the English courses. Students were not required to see a specific librarian for research consultations.

All students were required to take a course titled *Writing for Scholarly Audiences* as part of their general education requirements. This course is taught every year during the fall and spring semesters, and was intended to be a first-year writing course. However, because this was a new addition to the curriculum, students taking the course during the 2016-2017 academic year spanned all four undergraduate years. Students in the course also had a range of familiarity with IL: some had never been introduced to research, while others were quite fluent. Four of the students across the three class sections of *Writing for Scholarly Audiences* were also student workers at the library.

The study took place during the fall 2016 semester, during which three sections of the writing course were being taught. While the curriculum in each section was the same, the delivery method chosen by each instructor was different. There was a 100% acceptance rate of study involvement by the instructors teaching this course. All three sections required students to produce a research paper at the end of the semester. The research topics were selected by the students depending on their own interests.

Working with the researcher-librarian, each instructor requested a different approach to integrating library instruction within their section of the writing course. One professor requested the traditional 'one-shot-session' approach, which consisted of one 50-minute instructional seminar with the students. This time was split between 25 minutes of demonstration and 25 minutes for a workshop in which the students could research with the librarian present. Research consultations were optional for this section.

Another professor chose a partially embedded librarian approach; the librarian attended a total of 10 class periods as an observer. The majority of library instruction was delivered by the professor prior to the three days of instruction provided by the librarian. Of the 150 minutes of library instruction with the librarian in the second approach, approximately 100 minutes were allocated for a librarian-led research workshop with the students. Research consultations were optional in this section.

The third approach in the study was a fully embedded librarian experience involving librarian attendance in all of the sessions of this section of the course. Using this approach, the professor and the librarian had many opportunities throughout the semester to communicate about the class and the student's work. Two taught classes were led by the librarian for a total of 100 minutes - half of that time was used for a research workshop. The librarian was also invited to review assignments and provide feedback to students. These included annotated bibliography, the prospectus (topic pitch) and the first draft of the research paper. The librarian also helped grade the final research paper. In this third section of the course, at least one research consultation was required.

Table 1 summarises the similarities and differences between the three approaches examined in this study.

Table 1: Iteration 1 with three approaches to library instruction

Design Type	Amount of Time Spent in Classroom/Style of Instruction	Professor-Taught Concepts	Librarian-Demonstrated Resources and/or Concepts Taught
One-shot Instruction Session	<ul style="list-style-type: none"> • 1 Class period (50 minutes) • Demonstration with time to work • No collaboration between librarian and professor 	<ul style="list-style-type: none"> • Academic Search Premier • Worldcat Discovery Library catalogue • Google Scholar • Evaluation of Sources • Primary, Secondary, and Tertiary Sources 	<ul style="list-style-type: none"> • Films on Demand • Global Issues in Context • Overdrive • Interlibrary loan • Zotero • Research Assistance Program • Periodicals A to Z list
Partially Embedded Librarian	<ul style="list-style-type: none"> • First half of the semester • Three class periods set aside for library instruction by librarian (150 minutes) • Demonstration with time to work. More emphasis on time to work. • No collaboration between librarian and professor 	<ul style="list-style-type: none"> • Academic Search Premier • When to use subject specific databases • Primary, secondary, tertiary sources • Developing search terms • Difficult to research topics • Where to find help with citations 	<ul style="list-style-type: none"> • Library catalogue • Films on Demand • Global Issues in Context • Overdrive • Interlibrary loan • Zotero • Research assistance program • Periodicals A to Z list
Fully Embedded Librarian	<ul style="list-style-type: none"> • All semester • Three class periods set aside for library instruction by librarian; 1 did not happen (100 minutes) • Also “point of need” instruction provided when necessary • Demonstration as requested by students with time to work. More emphasis on time to work. • Collaboration between librarian and professor 	<ul style="list-style-type: none"> • Metacognition • Know your resources • Opinion versus informed research • Annotated bibliographies • Writing a summary • Outlining 	<ul style="list-style-type: none"> • Metacognition • Metaliteracy • Catalogue • Academic Search Premier • Students were asked to view research skills tutorial for in depth help on how to do research • Annotated bibliographies • Periodicals A to Z list • Interlibrary Loan • Research assistance program • In-text citations • Direct quotes • Paraphrasing • Works cited page • Literature review

All students registered in *Writing for Scholarly Audiences* (n=58) were invited to participate in the research; a total of 13 students agreed to participate. The study includes perspectives from students from all three class sections in fall 2016 (Section 1 = 7, Section 2 = 3, and Section 3 = 3). One can observe that there was a relatively low participation rate by students in this study. As the participant group was small and self-selected, we cannot draw generalisable conclusions

based on their responses. However, given the design-based research approach, this study served as an ideal opportunity to explore the concept of using the Col theoretical framework as a way to inform the integration of library instruction into first-year writing courses.

At the end of the first semester, a partnership grew between the professor who adopted the fully embedded librarian approach and the librarian. This partnership evolved to include a course redesign for the instructor's subsequent section of the course, which included integrating some ACRL Framework activities as well as an online forum for continued communication between the librarian, the students and the instructor. The redesign drew upon work done during the study and incorporated the Col theoretical framework but it was not part of the original research.. As it was implemented during the analysis and evaluation stage of this study, it has influenced the discussion and implications developed after the analysis of the results. This partnership and exploration of integrated library instruction continued for a third semester in the fall of 2018. The next section discusses how the first iteration of the study was analysed.

4. Findings

4.1 Data collection

For this study, the librarian developed the qualitative methods with input from her doctoral supervisory committee, which consisted of two instructors with backgrounds in design-based research and one academic librarian. Several data collection methods were used as the librarian explored different ways to conduct a primarily qualitative research study: observation data from classes, notes from two collaborative team meetings, a student questionnaire, a faculty questionnaire, student interviews and a research summary (student responses). The responses from the research summary were analysed to determine the extent to which different forms of library instruction influence students' understanding of the process of research and writing. At the beginning of the study, there was a collaborative design team meeting between the librarian and the instructors involved with the research study. A second meeting was held at the end of the semester between the librarian and the three instructors to debrief the instruction and the study. The transcripts from these meetings were prepared and analysed as part of the study. The librarian also kept a research diary throughout the study and continued the work in consecutive semesters. Data collected during the consecutive semesters consisted of field observations during the classes and researcher reflections.

At the end of the first semester, all of the instructors and students involved in the study were asked to complete a questionnaire that was developed specifically for this study. The questionnaires were neither piloted nor pre-tested. The analysis of data from these questionnaires was used to address both of the research questions. Section 1 saw a response rate of 3 out of 7 participants for the student questionnaire. Section 2 had a response rate of 2 out of 3 and section 3 had a response rate of 3 out of 3.

The student questionnaire included the following questions:

- 1) Did you view the librarian as part of your course? (yes or no)
- 2) If you answered yes to the first question, why did you view the librarian as part of your course? (short answer)
- 3) What do you think are the benefits of having a librarian attend class sessions outside of specific dates set aside for library instruction? (short answer)
- 4) If you chose not to attend a Research Assistance Program session with the librarian what was your reasoning for this? (short answer)
- 5) In your class, what role did you see the librarian as? (presenter, observer, co-teacher, other) (please specify) (Select all that apply)
- 6) Who should teach information literacy/library skills? (professor, librarian, both)

7) In what ways do you think library instruction helps improve your writing? (short answer)

All three instructors completed the faculty questionnaire. A summary of the findings is included in the next section. The instructors were asked these questions:

- 1) Did you allow the librarian to sit in on your class and provide point of need instruction? (yes or no)
- 2) If no, why did you opt out of this option? If yes, why did you decide to go this route? (short answer)
- 3) What do you think are the advantages of point of need instruction in the classroom setting by a librarian? (short answer)
- 4) Are there any disadvantages of point of need instruction in the classroom setting by a librarian? (short answer)
- 5) What role do you believe the librarian plays in the classroom? (observer, co-teacher, other (please specify))
- 6) Would you be interested in planning and team teaching ENGL 212 with a librarian for an entire semester? Why or Why not? (short answer)
- 7) In what ways do you think library instruction influences student learning? (Short answer)

Text-based responses to the open-ended questions for both questionnaires were analysed through coding and identifying themes in the data. Responses that required participants to select an answer were tabulated quantitatively and summarised using tables. The questionnaire was the only requirement for the instructors. The students however, had two additional requirements at the end of the semester.

Students were given the opportunity to meet with the librarian at the end of semester to provide feedback on the research study. This feedback was recorded and the transcript was analysed. Four individuals provided feedback and the interviews varied in length from seven to twelve minutes.. The students were given a prompt question and additional questions were based on the answer provided to the prompt. The initial question to the students was: *So how would you describe where you've started at the beginning of the semester to where you've finished? Think of yourself at the edge of the woods. Are you in the woods? Are you still at the edge? Have you come out of the other end?*

4.2 Analysis

Text-based data were used to analyse the potential uses of the Col theoretical framework to inform integrating library instruction into first-year writing courses. The data was analysed using the constant comparative method, which 'combines systematic data collection coding, and analysis with theoretical sampling to generate theory that is integrated, close to the data, and expressed in a form clear enough for future testing' (Conrad, Neumann, Haworth, & Scott, 1993, p.280).

The focus for data analysis was to explore whether there was any indication that the framework could be used as it relates to designing and delivering library instruction. The 'Categories' section of the Col theoretical framework was used during the first coding cycle; the second coding cycle saw the addition of the 'Indicators' section. Table 2 shows the codes used for the Col theoretical framework.

Table 2: Community of Inquiry theoretical framework coding (based on Garrison et al., 2000)

Elements	Categories	Indicators (examples only)
Cognitive Presence	Triggering event	Sense of puzzlement
	Exploration	Information exchange
	Integration	Connecting ideas
	Resolution	Applying new ideas
Social Presence	Emotional expression	Emoticons
	Open communication	Risk-free expression
	Group cohesion	Encouraging collaboration
Teaching Presence	Instructional management	Defining & initiating discussion topics
	Building understanding	Sharing personal meaning
	Direct instruction	Focusing discussion

After each cycle of coding was conducted, the results were checked by one of the writing instructors and the librarian’s doctoral supervisor. This method of member checking was used to verify the trustworthiness of the results. In the study, the Col theoretical framework was used to ‘describe and measure elements that supported the development of face-to-face learning communities within the embedded librarian approach’ (Bailey, 2017, p.109).

Through the analysis of the data the results seem to suggest that the Col theoretical framework can be used to inform the design of library instruction integrated into first-year writing courses as the following themes emerged:

- Building understanding (Teaching Presence)
- Direct instruction (Teaching Presence)
- Open communication (Social Presence)
- Exploration (Cognitive Presence)
- Integration (Cognitive Presence)
- Resolution (Cognitive Presence)

The following table summarises the examples found in the study to suggest that the Col theoretical framework can be useful to inform the design of library instruction.

Table 3: Summary of results

Col Element/ Category / Indicator	Example from Study
Teaching Presence/Building Understanding/ Sharing Personal Meaning	<p>Just-in-time instruction: <i>I think that the notion of the just-in-time instruction, that seems to me to be the only thing that works, the thing that works for the majority of students because you can introduce them to all – I can put up all the – I don't think they see relevance, until 'Oh shoot, now it's my turn to do this. What did she say? How do we do this?'</i> (Faculty Questionnaire)</p> <p>Hearing the same information from a different perspective: <i>She understood the syllabus and the assignments we needed to complete as much as our professor did, and when we could not easily access our professor, we could find her for clarification and direction.</i> (Student Questionnaire)</p> <p><i>It gives me another view point to examine my writing under, and provides me with knowledge on where to find tools I wouldn't have otherwise thought of or known of.</i> (Student Questionnaire)</p> <p>Developing integrated library instruction: <i>When the librarian and faculty member collaborated on the curriculum and class assignments, the students demonstrated a better understanding of the process of research and how it was connected to writing.</i> (Librarian Observation)</p>
Teaching Presence/Direct Instruction/ Focusing Discussion	<p>The use of embedded librarianship to increase interaction with librarian as a resource: <i>She was in the classroom with us nearly daily, she provided practical, integrated instruction.</i> (Student Questionnaire)</p> <p>Redesigning library instruction using the ACRL Framework: <i>Moving away from demonstration-style sessions between the first semester and the second semester appeared to help the students develop a better understanding of the different components that make up the process of research and writing.</i> (Librarian Observation)</p>
Social Presence/ Open Communication Risk-Free Expression	<p><i>The amount of communication between librarian and writing instructor influences the design of library instruction and the use of the librarian as a resource in the course. The more communication the greater the chance of an integration of library instruction that will best fit the needs of the students in that course as they understand the process of research and writing and how they are connected together.</i> (Librarian Observation)</p>
Cognitive Presence/Exploration/ Information Exchange	<p>Designing instruction to provide additional viewpoints on how to do research: <i>I think there are some things that the librarian, in this case you, can definitely re-emphasize, because hearing it from me once is not the same as hearing it from me once and hearing it from, from your perspective.</i> (Collaborative Design Team Meeting)</p> <p><i>Information is all around us. Students don't need to go to school to find and access information. What they need is help with thinking about how to behave in the presence of information. How to determine what's credible and what's useful or relevant.</i> (Collaborative Design Team Meeting)</p>

Col Element/ Category / Indicator	Example from Study
Cognitive Presence/Exploration/ Information Exchange	<p>Designing instruction to include additional resources/services outside of class time:</p> <p>Student response to the use of an optional Moodle research skills tutorial: <i>For me, it wasn't a problem because I'm a little bit more self-motivated where I can kind of like, 'Okay. I don't know how to do this. I'm just going to go on to Moodle.'</i> I do think for a lot of my peers it would have been more advantageous to either have it in class. Because the syllabus is almost always ignored. But I do think that for the class as a whole, yeah, you're going to have students that are going to be bored of it because we already understand how to do it and we know our tools, and you're going to have students who are going to be bored because they think, 'Oh I don't need it.' But I do think there's those few groups in the middle that are going to receive value from it. And I think it might have been useful for them. (Student Interview)</p> <p>Students who used the Research Assistance Program (one-on-one instruction) received individualized instruction on exploration in their specific topics. (Librarian Observation)</p>
Cognitive Presence/Integration/ Connecting Ideas	<p>Including additional viewpoints on the process of research:</p> <p><i>I've actually thought about having some of my past students, from this course, come in now that they have some insight on the process and talk about different aspects of the process including what they'd wished they'd asked the librarian, what they wished they had used in the library.</i> (Collaborative Team Meeting)</p> <p>Integrating Library Instruction into course content:</p> <p><i>For as long as I have been teaching it, librarians have always been adjunct to the course, and students have interacted with library faculty 'outside' of the regular course delivery. But putting the library instruction peripheral to 'substantive' course content risks teaching or modeling to the students that librarians are peripheral, and/or that the research process itself is extra-curricular.</i> (Faculty Questionnaire)</p> <p>When to integrate different elements of the research process into the course content:</p> <p><i>I might have had citations in a more full class period. Because you mentioned that you kind of like, 'Here's where you go', but I think a fuller conversation on citations should have been done a little earlier. I think that might have been a little more helpful. Because even though I wasn't using any of the two styles that you guys were talking about more, it was still a think that I'm like, 'Oh, I should check on that in my guide and figure out what this is for us.'</i> (Student Interview)</p> <p>When to suggest to students and/or require students to attend a one-on-one research appointment:</p> <p><i>Yeah. I would think, maybe before the second draft is due. If the second draft is due on Friday, then have the consultations stop that Monday. Have them on that Monday, and then no more after that Monday.</i> (Student Interview)</p> <p><i>For me, probably earlier, because I found a lot of my resources, but I didn't know which ones were supposed to be used, or could be used. So I think earlier would have helped me a little bit more.</i> (Student Interview)</p>

Col Element/ Category / Indicator	Example from Study
Cognitive Presence/Integration/ Connecting Ideas	<p>How to integrate library sessions in course content: <i>For me I feel like what we need is a list of what I think they need to know. And then boiling it down to what on this list can I teach. What on this list would really work better on a series of instruction videos that they have to watch and they do a brief quiz on. Which would be self-taught right? And which of these pieces do you provide because of your expertise. (Second Collaborative Team Meeting at the end of the study)</i></p> <p><i>I feel like library instruction for them right now might be a little like orientation week. Lots of stuff being thrown at them and most of it going over their head because those are the kind of tedious things...they don't know that they can make an account. Again on a list. Having a list of what they need to know for the students, what can be done the teacher him or herself and what is left that really needs an expert. (Second Collaborative Team Meeting at the end of the study)</i></p> <p>What content should the librarian teach: <i>Well for example maybe advanced search skills...they still don't know the difference between what a primary, secondary, and tertiary source is and how to use them. (Second Collaborative Team Meeting at the end of the study)</i></p> <p>Students made the connection between research and writing: <i>During the second semester, after implementing Col and the ACRL Framework, the researcher and librarian observed final presentations in which students discussed the process of research and how it was connected to writing. (Librarian Observation)</i></p>
Cognitive Presence/Resolution/ Applying new ideas	<p>Including library instruction at the point of need in the course content: <i>[she] do[es] not want students to see me [the professor] as their only resource. They need to make use of a wide range of resources – human and other. (Faculty Questionnaire)</i></p> <p><i>Having the librarian embedded in the course moves the person and the process directly into the center, makes the library work central and substantive, and affirms both practically and theoretically the role of librarian-as-resource as well as research-and-reading as central. (Faculty Questionnaire)</i></p> <p>Using the Col Framework: <i>The more attention I focus on the teaching presence, cognitive presence and social presence, the better the library instruction seems to be integrated into the course. A business professor shared with me that in all 12 years of teaching this course, she believed I brought something new to the session because I integrated instruction directly into what the students were doing. (Librarian Observation)</i></p>

4.3 Limitations

One limitation of this study is the low rate of student participation in data collection. In addition, most qualitative data collection methods used in this study have not been externally validated. Multiple forms of data were collected and analysed to provide useful insights on local impact. Therefore, while we can offer our interpretation of the outcomes of this collaboration, implementation and evaluation cycle to inform further work, additional research is called for to validate the use of Col theoretical framework in the area of integrating library instruction into

first-year writing courses. In the next section, we use the work of Mary K. Stewart (2017, 2018, 2019) to suggest further steps as librarians and first-year writing instructors collaborate on the integration of library instruction to help students understand the process of research and writing.

5. Discussion

This design-based research offers an entry point to explore the use of the Col theoretical framework to inform the design of library instruction within first-year writing courses. We were only able to see glimpses of the Col theoretical framework in the data that was collected during this initial entry point. Because this is a new area of research, it is too early to determine the full effect of applying this theoretical framework in the field of library science. However, it does appear to hold both promise and potential. The use of the Col theoretical framework in blended classrooms as an instructional approach has been gaining ground in the research since we started this work in 2016 (Hilliard & Stewart, 2019; Stewart 2017; Stewart, 2018; Stewart, 2019). Warner (2016) discusses using the Col theoretical framework to redesign his face-to-face class by adding a teamwork approach to writing a paper as well as including an online discussion forum. With this redesign, Warner (2016) moved away from the conventional face-to-face only class to a blended learning environment complemented by additional online resources and activities.

Researchers suggest that a successful creation of a community of learners where learning happens collaboratively is determined by the type of activities that are implemented within the course (deNoyelles, Zydney, & Chen, 2014; Stewart, 2017). Stewart (2017) offers a suggestion on how to design hands-on activities within a course by asking a series of questions. She also provides an example of this approach with the use of an asynchronous discussion forum; two of the four steps are summarised in Table 4.

Table 4: Using the Col theoretical framework to inform hands-on activities (adapted from Stewart, 2017)

2 of 4 Steps	Some Heuristic Questions	Asynchronous Discussion Forum (ADF) Example
Step 1: Identify cognitive goals of the activity (in this case an asynchronous discussion forum)	<ul style="list-style-type: none"> • What do you want the students to achieve as a result of interacting with peers? • What will be the triggering event for the interaction? 	<p>The cognitive goal is being exposed to and then building upon multiple perspectives during individual knowledge construction.</p> <ul style="list-style-type: none"> • Triggering event: a question about intellectual property • Exploration: hearing others' views of intellectual property
Step 2: Determine how and why social presence will support that cognitive goal	<ul style="list-style-type: none"> • Why do students need to feel real to one another in order to achieve the cognitive goal? • How does interacting with peers specifically support student <i>learning</i>? 	<p>Students need to feel real to each other so that they view classmates' perspectives as valuable. Interacting supports learning because the diverse viewpoints will directly contribute to the development of the argumentative essay.</p>

deNoyelles et al. (2014) suggest that the Col theoretical framework can be used to inform online discussions through the design and facilitation of the forum. Based on a review of literature, they offer the following strategies:

- Model social presence
- Select a discussion prompt that encourages structured interaction and critical thinking, while also supporting the specific learning objectives
- Provide prompt but modest feedback
- Facilitate purposefully
- Provide feedback through multimedia
- Encourage peers to facilitate (deNoyelles et al., 2014, pp.161–162)

Creating communities of inquiry within first-year writing courses is ideal because of the shared theoretical alignment between writing and research (Stewart 2019). Garrison (2017) states that ‘thinking and learning collaboratively is a pragmatic reality and necessity in today’s connected knowledge society’ (p.12). The ACRL *Framework* is designed to help librarians develop instruction for this ‘connected knowledge society.’ Therefore, we argue that using the Col theoretical framework to design and evaluate library instruction in collaboration with faculty members is an appropriate next step. The ways in which librarians conduct this research can be informed by the work started by Mary K. Stewart given the shared concepts between writing instructors and librarians. Stewart (2019) advocates for using the Col survey ‘as an assessment tool in composition studies’ (p.41). Through Stewart’s exploration of using the Col theoretical framework to inform first-year writing courses, she has modified the Col theoretical framework survey so that it may be used to assess writing (Stewart 2019). We offer an additional modification to the Col theoretical framework survey to assess library instruction that is designed using the ACRL *Framework*. The following table shows the modifications made for the writing survey as well as our suggested modifications.

Table 5: Modified Col survey for library instruction (adapted from Stewart, 2019)

Original Col Survey	Writing-Specific Col Survey	Library Instruction-Specific Col Survey
Items 1–8, 16–17	No change.	No change.
9. Online discussions help me to develop a sense of collaboration.	Online discussions helped me to develop as a writer.	Online discussions helped me to develop as a researcher.
10. This item was not part of the original survey.	Interacting with classmates improved my writing.	Interacting with classmates improved my research.
11. Problems posed increased my interest in course issues.	Course assignments increased my interest in writing-related issues.	Library instruction increased my interest in research-related issues.
12. Course activities piqued my curiosity.	No change.	Library instruction activities piqued my curiosity.
13. I felt motivated to explore content related questions	I felt motivated to explore questions raised in this course.	I felt motivated to explore a wider range of research questions raised in this course.
14. I utilised a variety of information sources to explore problems posed in this course.	I utilised a variety of information sources to learn more about the topics I wrote about.	No change.
15. Brainstorming and finding relevant information helped me resolve content related questions.	Brainstorming and finding relevant information improved my writing process.	No change.

Original Col Survey	Writing-Specific Col Survey	Library Instruction-Specific Col Survey
18. Learning activities helped me construct explanations/solutions.	No change.	One-on-one research consultations helped me construct explanations/solutions.
19. Reflection on course content and discussion helped me understand fundamental concepts in this class.	Reflecting on course activities and discussions helped me understand fundamental concepts about writing.	Reflecting on library instruction helped me understand fundamental concepts about research.
20. I can describe ways to test and apply the knowledge created in this course.	I can describe ways to test and apply the writing skills I learned in this course.	I can describe ways to test and apply the research skills I learned in this course.
Original Col Survey	Writing-Specific Col Survey	Library Instruction-Specific Col Survey
21. I have developed solutions to course problems that can be applied to practice.	I have developed solutions to issues raised in this course that can be applied in practice.	I have developed research strategies that can be applied to researching in other courses.
22. I can apply the knowledge created in this course to my work or other non-class related activities.	I can apply the writing skills I learned in this course to my work or other non-class related activities.	I can apply the research skills I learned in this course to my work or other non-class related activities.
23. The instructor clearly communicated important course topics.	No change.	The librarian clearly communicated important research strategies.
24. The instructor clearly communicated important course goals.	No change.	The librarian clearly communicated important research resources.
25. The instructor clearly communicated on how to participate in course learning activities.	No change.	The librarian clearly communicated on how to participate in course research activities.
26. The instructor clearly communicated important due dates/time frames for learning activities.	No change.	The librarian clearly communicated important due dates/time frames for research activities.
27. The instructor was helpful on identifying areas of agreement and disagreement on course topics that helped me to learn.	No change.	The librarian was helpful in helping me understand the scholarly conversation related to my topic.
28. The instructor was helpful in guiding the class towards understand writing strategies in a way that improved my writing process.	No change.	The librarian was helpful in guiding the class towards understanding the process of research as it relates to writing.
29. The instructor helped to keep participants engaged and participating in productive dialogue.	No change.	The librarian helped to keep participants engaged and participating in productive dialogue.

Original Col Survey	Writing-Specific Col Survey	Library Instruction-Specific Col Survey
30. The instructor helped to keep the course participants on task in a way that helped me learn.	No change.	The librarian helped to keep the course participants on task in a way that helped me learn.
31. The instructor encouraged course participants to explore new concepts in this course.	No change.	The librarian encouraged course participants to explore new library resources and services.
32. Instructor actions reinforced the development of a sense of community among course participants.	No change.	The librarian actions reinforced the development of a sense of community among course participants.
Original Col Survey	Writing-Specific Col Survey	Library Instruction-Specific Col Survey
33. The instructor helped to focus discussion on relevant issues in a way that helped me to learn.	No change.	The librarian helped to focus discussion on relevant issues in a way that helped me to learn.
34. The instructor provided feedback that helped me understand my strengths and weaknesses.	The instructor provided feedback that helped me understand my strengths and weaknesses as a writer.	The librarian provided feedback that helped me understand my strengths and weaknesses as a researcher.
35. The instructor provided feedback in a timely fashion.	No change.	The librarian provided feedback in a timely fashion.

Stewart (2019) calls for further research to ‘study the value of the Col survey for assessing face-to-face and blended writing courses’ and suggests that the survey be combined with ‘interview, focus group, or observational data to gain a better understanding of the toll in the context of composition instruction’ (p.48). We argue that the same mixed methods can be employed in design-based research to evaluate the design and use of a Col survey related to library instruction.

Qualitative analysis of text-based methods is based on disciplined inquiry and the interpretation of the researchers when analysing the data. Researchers create codebooks developed during the analysis of the data as part of the qualitative analysis process (Bailey, 2017; Stewart, 2019). To our knowledge, the coding for Col has not been significantly modified since 2000; given the blended nature of the use of the Col theoretical framework in library instruction, it may be timely to update the Col codebook, as this could offer further validation to study results. Both Bailey (2017) and Stewart (2019) analysed their data line-by-line to create conceptual codes. These codes were then merged using the constant comparison method to reduce redundancy. In reviewing the coding clusters created by Stewart (2019), we offer the categories below as a stepping-off point in the creation of a codebook used to assess the Col theoretical framework in blended learning environments. These categories would then need to be mapped to the three presences as indicators of each presence:

- Available Tools
 - Tech Online
 - Tech in Class
- Instructor Participation

- Deliverables
- Giving Instruction
- Grading/Feedback
- Student–Student Interaction
 - Outcomes of Interaction
 - Rapport

6. Conclusion

Through this initial exploration of the use of Col in our research and the review of recent literature, we contend that there is both promise and potential in librarians and first-year writing instructors using the Col theoretical framework in their collaborative design of library instruction. Suggested modifications presented here and ideas of how to use the Col theoretical framework to design hands-on activities need to be studied further by both librarians and first-year writing instructors. Using the Col theoretical framework offers a way to evaluate the learning environment that is created through shared theoretical concepts from both fields. Building integrated library instruction in this manner holds promise for helping students to connect research and writing as essential processes in achieving positive learning outcomes on writing assignments.

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